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The Course of Oil

By K. C. SCLATER

Disquieting Proration Order

A storm of protest arose over the action of the Texas Railroad Commission in issuing the April proration order discontinuing Saturday shutdowns. In view of the evidence and information elicited by the Commission at its hearing in March, the order came as a surprise and a disappointment to the Texas oil industry. Bitter resentment was aroused because it was believed the new order was against the best interests of the State of Texas as well as the oil industry. The Commission had to modify its original order and restore the allowable production in several fields in which the allowable had been reduced.

This action of the Railroad Commission has created a feeling of uneasiness not only in Texas but throughout the industry. Being the largest oil-producing state and also a prominent member of the Interstate Compact, Texas is a powerful influence for stability in the production of oil. It is a leader in fostering sound production and conservation practices. Because of the economic importance of its own oil resources it cannot afford to jeopardize this leadership by issuing hastily conceived or ill-advised proration orders.

What motives inspired issuance of the April proration order are not known. There is certainly nothing to indicate that the order was based on data adduced at the March hearing. If there has been a wanton disregard of these data in issuing the April order, the oil industry of Texas is entitled to know why.

Mid-Continent Water-Flooding Group

All secondary recovery projects, particularly those of water-flooding, usually involve cooperative action. No operator would think of water-flooding his own properties unless other operators, whose wells produced from the same reservoir, cooperated in the project. The benefits of such cooperation are obvious.

Among those engaged in water-flooding in northeastern Oklahoma and southeastern Kansas a still broader form of cooperation has taken shape. A research group has been formed to study water-flooding problems. This group, comprised of companies and persons engaged in water-flooding operations in these areas, will pool their experience and data. All work to be done by the group will be under the guidance of an advisory board, which will be comprised of one representative from each participating company. All the technical work will be done by an independent laboratory.

It is estimated that there are some 6500 acres, comprising sixty different projects, in Kansas and Oklahoma to which water-flooding is being applied.

Average water-flooding development costs per acre, it is estimated, now range from eight or nine hundred dollars to fifteen or sixteen hundred dollars, the cost depending on depth, well-spacing, and other considerations. The possibilities of reducing costs and increasing recovery by water-flooding appear to be quite attractive and justify broader cooperative action.

Formation of this cooperative group is therefore an important undertaking that should have far-reaching results in advancing water-flooding practice in the Mid-Continent area.

Kinks and Devices

Proration is having a profound effect on production practice. This takes many forms. When a well's production is to be restricted, the well must be tested to determine its potential capacity to produce. It is on this potential test that the well's allowable production is based.

Making potential tests on pumping wells involves pumping the oil to the surface as fast as it flows into the well. Obviously, the determination of a pumping well's potential may be subject to wide error, unless advantage is taken of available kinks and devices.

One of these kinks is to pump the well down to a required level and adjust the rate of pumping to maintain this level. From the quantity pumped and the rate at which the level is reduced and rate of production required to maintain the minimum level, the potential of a well may be determined with reasonable accuracy. Among the latest and simplest devices in use for accurately and quickly determining the fluid level are the echometer and depthograph. Such devices, although their design is based on scientific principles, may be used without difficulty by the man in the field.

This is a typical example of how proration is leading to the development of new, simple, and efficient methods and devices for observing and determining a pumping well's capacity to produce, information that proration requirements now demand should be known with a reasonable degree of accuracy.

Engineering Students Lend Aid

Forty senior students in the School of Petroleum Engineering, University of Texas, spent one week during this month in the Texas Panhandle assisting the engineering staff of the Texas Railroad Commission in making semi-annual flow tests on gas wells. The students were paid—at least enough to cover their expenses—for their services.

As it was required to test the potential flow of every gas well in the Panhandle field, the work demanded a force of men much larger than the staff of engineers in the regular employ of the Railroad Commission. By augmenting the staff with engineering students a double purpose was served. The students gained valuable field experience in gas-well measurement; and the Commission was spared the difficult task of engaging temporary competent engineering aid.

The Commission has made a practice for several years of engaging engineering students for temporary summer work in the field.

This laudable practice ought to be encouraged.

THIS WIRE ROPE NEVER HAD A CHANCE to give the full service of which it was actually capable. It was a victim of adverse working conditions. It was used on a sheave too small for its size and construction, and the high bending stresses imposed on the wires resulted in fatigue and premature failure. A condition of this kind (sheaves or drums too small) is both *unsafe* and *costly*.

In order to obtain the most economical service from wire rope, it is of vital importance that drum and sheave diameters are as large as possible.

Standard practice has established certain ratios for sheave and drum diameters for the various wire rope constructions, which are given in the following tables. All diameters are to be measured from bottom of groove.

It should be understood that diameters listed as "minimum" are not recommended. Sheaves and drums of recommended diameters, *or larger*, will give increased rope life—consequently, more economical service. Anything smaller than "minimum" is critical—for both efficiency and safety.

Rope Construction	Average Diameters Recommended	Minimum Diameters
6 x 37 Round Strand	27 times rope diam.	18 times rope diam.
8 x 19 Round Strand	31 " " "	21 " " "
6 x 19 Round Strand "Style B" Flattened Strand "Style G" Flattened Strand	45 " " "	30 " " "
6 x 7 Round Strand "Style D" Flattened Strand	72 " " "	42 " " "

This advertisement is published for the purpose of helping all wire rope users obtain safer and more economical service from their wire rope. We also publish a booklet "*Practical Information on the Use and Care of Wire Rope*," and we would be glad to send a complimentary copy to anyone interested.

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« « HIGHLIGHTS IN OILDOM » »

Japan Buys Texas Crude Oil

The Tatekawa Maru, privately owned Nipponese vessel, which holds 91,700 bbl. and is one of the fastest tankers afloat, being rated at 17 knots, recently waited nearly two weeks in Houston for a full cargo of Rodessa oil to be assembled. The Itukusima Maru, another privately owned Japanese vessel, sailed from Houston last month with 82,000 bbl. of topped crude bound for Yokohama. It is not understood why the Japanese prefer Mid-Continent oil when petroleum of all types may be purchased in California. An interesting point in this connection is the fact that toll charges through the Panama Canal, both ways, amount to 8 cents per barrel.

Peru Buys Oil Field

The Government of Peru has purchased the Zorritos oil development in that country, including the existing wells, refinery, and oil equipment, according to a report from Consul General Brett, Lima, made public by the Department of Commerce.

The price paid was 2,920,000 soles, or approximately $584,000. The Zorritos oil development, in Province Tumbes, is the smallest but one of the oldest fields in Peru. Production of crude oil from the field was 39,214 bbl. in 1938; 49,102 bbl. in 1937. It is reported that the Government will supply the Petroleum Department with funds for working capital. All work will be performed under the supervision of engineers regularly employed by the Peruvian Government, according to the report.

Oil Equipment Exports Increase

According to the Machinery Division of the Department of Commerce, smaller export shipments were made in February, 1939, than a year ago in all major groups of industrial machinery except in mining, well, and pumping equipment, which registered a 7 percent increase. Total exports of industrial machinery from the United States were valued at $20,752,959 in February, 1939; $23,631,271 in February, 1938—a decrease of 12 percent.

American exporters of mining, well, and pumping equipment made shipments abroad during February valued at $4,985,230, a 7 percent gain over the corresponding figure for 1938 of $4,674,442. Most of this increase was reported in petroleum, well, and refining equipment, the exports of which during the month were valued at $3,324,581 compared with $2,868,881 a year ago.

Missouri Prepares For Regulation of Oil and Gas Production

Missouri's legislature has before it a bill designed to regulate production of crude petroleum and gas. Representative A. H. Cooper (D), Maryville, stated that "nothing in the measure will curb or restrict drilling." The principal object of the bill is to prevent waste and to give the state geologist power to issue regulations for drilling and for abandoning wells.

All But 120 Texas Counties Produce Oil

Of the 254 counties in Texas, 134 have yielded oil and gas, according to a survey released by the Texas Mid-Continent Oil and Gas Association, Dallas, Texas. During 1938, the discovery of 117 new fields throughout the State added seven counties to the list. Geophysical exploration and knowledge of the geological history of the State indicate that many potential oil fields remain to be discovered in Texas. The known underground supply of petroleum in Texas represents more than half the known supply in the United States.

F.P.C. Looks at Rocky Mountain Gas Rates

The Federal Power Commission has started an investigation of five Rocky Mountain gas companies on the charge that through interlocking corporate connections the companies have maintained rates that are "unjust, unreasonable, and discriminatory". The federal body was petitioned by the City Council of Denver and the Wyoming Public Service Commission in protest against the town border rates of 42 cents paid by Cheyenne and the 40 cents paid by Denver.

T.V.A. Goes Into Gas Business

The electric and gas properties of the Memphis (Tennessee) Power and Light Company are to be purchased by the Tennessee Valley Authority and the city of Memphis. The utility will retain one generating station and the transmission lines in Arkansas and Mississippi. T.V.A will pay $2,110,000 of the total of $17,360,000 to be paid for the properties. The rest will be paid by the city of Memphis. It is expected that gas rates will be cut 15 to 18 percent by the city of Memphis.

Germany Finds Helium Deposit

It is reported that German drillers have discovered a small quantity of helium near the town of Bentheim, Germany, just across the border in Germany from Oldenzaal, The Netherlands. The gas is being held underground at a pressure of 150 atmospheres (2250 lb.) pending a means of transporting it to a point where it may be used in filling one or more zeppelins. Other wells will be drilled to determine the extent of the helium reservoir.

Italy Subsidizes Oil Search

The Italian Government has authorized the expenditure of 60,000,000 lire (approximately $3,156,000) as a subsidy to Azienda Generale Italiana Petroli (A.G.I.P.—Italian Petroleum Administration) to search for petroleum in Italy, according to a report to the Department of Commerce from the office of the American commercial attaché at Rome. The money is to be used during the five-year period from July 1, 1939, to June 30, 1944. The subsidy is the third of its kind and brings the total subsidy to 168,000,000 lire (approximately $8,836,800) to A.G.I.P. for the search for petroleum.

Production Increases in Netherlands Indies

Crude oil production in the Netherlands Indies increased from 1,810,250 metric tons (12,671,750 bbl.) in the third quarter of 1938 to 1,916,915 tons (13,418,405 bbl.) in the fourth quarter, and compared with 1,888,025 tons (13,216,175 bbl.) in the third quarter of 1937, according to a report to the Department of Commerce from the office of the American commercial attaché at Java.

Production for the year 1938, amounting to 7,398,584 metric tons (51,790,095 bbl.) was the largest in the history of Netherlands Indies, although the increase over the 1937 record-breaking production of 7,263,480 tons (50,844,360 bbl.) was only 2 percent. The increase in 1938 was due almost entirely to larger production in Djambi, as the other fields produced about the same amount as in 1937.

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Major Pipe Line Activities

AT a recent hearing before the Federal Power Commission, consideration was given to the various proposals to build pipe lines to transport natural gas into the Mesabi iron-mining region of northern Minnesota. Petitions for permits to construct lines were presented by the Public Service Company of Montana, the North Dakota Consumers Gas Company, and the Kansas Pipe Line and Gas Company. Petitions of coal interests protesting the pipe line proposals have been rejected by the commission. A protest has also been filed by Montana-Dakota Utilities Company, owner of a line now serving a part of the North Dakota market, on the ground that the pipe lines would interfere in its established territory.

Among other figures presented, the Kansas Pipe Line and Gas Company estimated the cost of a line from Kansas to Minnesota to be $21,500,000. A gross annual revenue of $5,015,000 is expected from sales to ore smelters and other markets. The rate to mines for smelting operations would be a combination of a commodity charge of 15 cents per M cu. ft. of gas consumed plus a demand charge of $30 per year for each M cu. ft. of established demand. The company has contracted for a supply of gas in the Hugoton field at 4 cents per M cu. ft.

●

Three boat-loads of men and equipment have arrived at Guanta, Venezuela, on the Caribbean coast of South America to start work on the 105-mile 16-in. oil pipe line to be built for Mene Grande Oil Company, a subsidiary of Gulf Oil Corporation. The line will provide an outlet to the Caribbean for production from the fields of central Venezuela.

●

Sinclair Refining Company, Pipe Line Department, has begun construction of 65 miles of 6-in. pipe line as an outlet from the K.M.A. field of Wichita County, Texas. The line will originate in the south part of the field and connect with the company's 10-in. trunk line at the pump station situated near Hensley, Texas. The additional outlet will be welcomed by the many operators who have been unable to obtain pipe-line connection since proration was lifted in the field.

●

In New Mexico, the Silver City-Hurley pipe line will be extended from Hurley to supply natural gas to the U. S. Veterans' Hospital at Fort Bayard, New Mexico. The Lea County Gas Company, owner of the line, will start construction of the extension immediately. Gas for the heating load at the hospital will be purchased from the El Paso (Texas) Natural Gas Company.

●

Beaumont Natural Gas Company is laying a pipe line from the West Beaumont field to Beaumont, Texas, to supply natural gas to industrial customers. The company was recently organized at Austin, Texas, by M. C. Ashley, W. H. Parker, and Glenn H. McCarthy, all of Houston.

●

Humble Oil and Refining Company has leased a portion of the H. H. Dailey Estate tract of the J. G. Thompson Survey as a site for a permanent pump station on the line from Navarro Crossing field, Houston County, Texas. Construction of the station probably will start before the end of April and will include erection of a 55,000-bbl. tank.

A 3-in. pipe line has been built as an outlet for production from the Atlanta field, Columbia County, Arkansas. The discovery well in this field, Beene No. 1, was completed last December by Tide Water-Associated Oil Company and Seaboard Oil Company. The new line extends from the Beene well, in section 15-18-19, to the Arkansas-Louisiana Pipe Line Company's pump station in section 21-17-20.

●

Republic Pipe Line Company is building a 6-in. welded oil line from the East White Point field in San Patricio County, Texas, across Nueces Bay to the company's loading facilities on the Corpus Christi ship channel.

●

Additional outlet for Magnolia Petroleum Company's Illinois production is definitely assured by the recently announced plans of Socony-Vacuum Oil Company, Inc., to lay a 10-in. line from Wood River, Illinois, to Lima, Ohio. The 360 miles of line will constitute one of the largest pipe-line projects in recent years. Initial capacity of the line will be 40,000 bbl. daily. The total expenditure for line and station construction will approximate $5,000,000.

●

Standard Oil Company of Louisiana has announced its plans to lay 35 miles of 8-in. oil pipe line from Haynesville, Louisiana, to the Buckner, Magnolia, and Village fields in Columbia County, Arkansas.

●

An additional outlet for production in Columbia County, Arkansas, will be provided by the 6-in. line to be constructed by the Columbia Pipe Line Company. The line will be laid from the Magnolia field to The Texas Company's trunk line near the town of Atlanta, Arkansas.

●

Revamping its pipe-line system in North Texas to reduce the amount of line and to obtain better gravitation, Humble Pipe Line Company is laying 25 miles of 4-in. line from the south part of Throckmorton County to its pump station on the Matthews ranch in Shackelford County, near Albany, Texas. Simultaneously, the company is reclaiming approximately 40 miles of 4-in. line in Young, Throckmorton, and Stephens counties.

●

The gathering system of Oklahoma Pipe Line Company in Jefferson County, Oklahoma, has been purchased by Ben Franklin Refining Company, Ardmore, Oklahoma. The new owner will continue to take a maximum of 5 bbl. per day per well in the Seay, Oscar, and Spring pools.

●

After being shut-in for more than a year, the five wells in the North Rock pool, Cowley County, Kansas, will be connected to the line of the Sinclair Refining Company, Pipe Line Department, that passes through the field. The five wells are permitted to produce 2500 bbl. of oil monthly, under state proration orders.

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A high percentage of oil country operators have found Youngstown Oil Country Tubular Goods a trustworthy factor in low-cost drilling. Dependable strength and unvarying uniformity justify this trust.
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Activities in the Oil Fields

INTEREST in drilling in the State of Georgia is centered in seven test wells now underway. Of these, Pan-American Production Company's well, in lot 332, land district 4, and Georgia Resources, Inc. and Renard Oil Company's Gillican No. 1, in lot 200, land district 12, Clinch County, have attracted most attention. The former is drilling at a depth exceeding 1000 ft., using a 132-ft. derrick and rotary equipment. In the other well, stove-pipe casing was set to case-off a quicksand encountered in spudding. A spudder is being used to drill through the upper zones, after which rotary equipment will be installed.

●

The long-awaited drilling campaign in Missouri has started in earnest, tests being made in ten counties. First well to be started, J. H. Everitt's No. 1 Spring, in section 30-62-38w, Holt County, near Mound City, is reported to have entered the Mississippi Lime at a depth of 1902 ft. Several oil and gas shows have been reported in the well.

●

A new producing zone in the Beaver pool, Barton County, Kansas, has been discovered in Martin and Hearing's No. 1 Feltes, in NW SW SE of section 8-16-12w. Initial daily production of the well was 2546 bbl. of oil and 10,000,000 cu. ft. of gas, but the well will be acidized. The well, in addition to being one of the shallowest producers in Barton County, extends the Beaver pool three-quarters of a mile northwestward. Other wells in the pool are producing from the Arbuckle dolomite and the Gorham sand. Total depth of the well is 2906 ft.

●

Continental Oil Company's No. A-4-8 K.C.L., in San Joaquin Valley near Wasco, California, had an initial daily production of 3587 bbl. of oil and 750,000,000 cu. ft. of gas from the Rio Bravo zone, a formation of Miocene age, which is the most prolific producing sand yet discovered on the west coast. The well is located just south of Continental's No. A-2 K.C.L. drilled last year to a depth of 15,004 ft. but plugged back to 13,100 ft., at which depth it flowed 3000 bbl. per day. The new well was completed at a total depth of 13,153 ft.

●

Magnolia Petroleum Company's No. 1 Roseberry, in section 29-23n-9w, at Shongaloo, Webster Parish, Louisiana, was plugged-back from 9380 ft. to 9182 ft. and flowed 250 bbl. per day of 49.8-deg. gravity oil through a 5/16-in. choke. This is the first oil produced from the lower Marine formation in northern Louisiana.

●

Oklahoma's deepest wildcat, Continental Oil Company's No. 1 Proctor, in C NW of section 28-19-20w, Washita County, encountered a good show of gas at a depth of 10,760 ft.

●

Duncan's No. 1 J. H. Liggett, in SE NW SE of section 17-5n-5e, northwest Clay County, Illinois, may have opened a new pool in the Illinois Basin. Potential production of the well is estimated to be 900 bbl. per day. The well produces from the Aux Vases formation at a depth of 2380 ft., between the Benoist and the McClosky formations.

●

Shelby County, Illinois, has its first producing oil well. J. A. Aylward's No. 1 Wabash Railroad, in C N NE of section 27-10n-5e, near the town of Sewardson, produced 100 bbl. per day from the Benoist sand at a depth of 1937 to 1947 ft.

AVERAGE CRUDE PRICES

California		Louisiana	
Kettleman Hills	$1.19-1.43	Rodessa	$ 1.05
Playa Del Rey	.80-1.16	Gulf Coast	.74-1.20
Coalinga	.70- .90	North Louisiana	.73-1.05
Signal Hill	.80-1.21	Illinois	1.05-1.15
Montana	.90-1.10	Kentucky	1.10-1.20
Wyoming	.35-1.30	Indiana	1.05
Colorado	.90- .98	Ohio	
New Mexico	.77-1.00	Lima	.90
Texas		Michigan	.70-92.5
North Central	.71-1.03	Pennsylvania	
Panhandle	.67- .96	Bradford	2.00
West Texas	.53- .95	Southwest	1.65
Gulf Coast	.79-1.28	Eureka	1.59
Darst Creek	.96	Buckeye	1.55
East Texas	1.10	Corning	1.02
Talco	.55	Canada	2.10-2.17
Kansas	.60-1.10		
Oklahoma	.60-1.10		
Arkansas	.73		

DAILY AVERAGE CRUDE OIL PRODUCTION

Data Supplied by A.P.I.

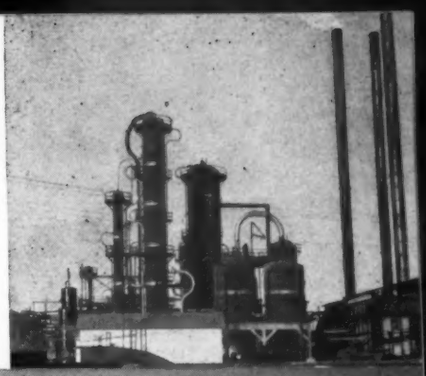
(Figures in Barrels)

	[1]B. of M. Calculated Requirements (April)	Week Ended Apr. 1 1939	4 Weeks Ended Apr. 1 1939	Week Ended Apr. 2 1938
Oklahoma	473,300	422,200	441,600	491,850
Kansas	152,700	167,000	158,500	166,400
Panhandle Texas		64,150	64,450	66,650
North Texas		84,300	81,500	72,600
West Central Texas		31,000	30,700	28,950
West Texas		211,650	210,800	191,950
East Central Texas		99,950	96,700	98,950
East Texas		372,700	372,800	429,700
Southwest Texas		251,400	249,600	229,900
Coastal Texas		219,300	218,000	202,200
TOTAL TEXAS	1,412,700	1,334,450	1,324,550	1,320,900
North Louisiana		69,200	70,900	80,250
Coastal Louisiana		191,200	191,650	182,200
TOTAL LA.	262,000	260,400	262,550	262,450
Arkansas	53,300	54,250	53,550	54,400
Illinois	149,300	169,300	166,650	(
Eastern				(142,600
(Not including Ill.)	104,800	99,250	96,800	(
Michigan	48,300	58,100	58,500	52,850
Wyoming	50,000	56,150	53,900	48,550
Montana	15,300	13,250	13,550	13,500
Colorado	5,000	3,750	3,750	4,300
New Mexico	115,300	108,600	109,400	104,950
TOTAL EAST OF CALIF.	2,842,000	2,746,700	2,743,300	2,662,750
California	592,000	611,500	626,100	704,500
TOTAL U. S.	3,434,000	3,358,200	3,369,400	3,367,250

[1]These are Bureau of Mines' calculations of the requirements of domestic crude oil based upon certain premises outlined in its detailed forecast for the month of April. As requirements may be supplied either from stocks, or from new production, contemplated withdrawals from crude oil inventories must be deducted from the Bureau's estimated requirements to determine the amount of new crude to be produced.

SPEAK OF PHENOL, and American industry thinks of The Dow Chemical Company. For Dow pioneered its own, special process for synthetic phenol production and is the world's largest single producer of this important chemical. Among the many uses of phenol is its application in oil refining.

DOW



THE LATEST—JELFLAKE SEAL

IN ANNOUNCING its newest service—Jelflake Seal—Dowell can point to the importance of its association with The Dow Chemical Company. The same research—the same technical leadership that is giving American industry phenol and over 300 other important chemicals, collaborated with Dowell in developing Dowell Jelflake Seal—a great, new advance in chemical well treating.

Specifically, Dowell Jelflake Seal is used to seal temporarily the extremely porous sections of the formation, thus permitting the acidizing of less permeable pay zones. It is a flake material plus a carrying agent of low viscosity that sets up as a stiff gel—"plating" the formation. Therefore, when acid is introduced, it is fully effective in the tight areas. In 18 to 36 hours the jell liquefies and is readily pumped or flowed from the well with the spent acid.

Dowell Jelflake Seal is only one of a great many materials and services originated and perfected by Dowell and its parent organization, The Dow Chemical Company. This leadership is recognized by many thousands of oil operators who consistently—

...men who attend the Houston Oil World Exposition are cordially invited to visit Dowell's Exhibit.

Look to

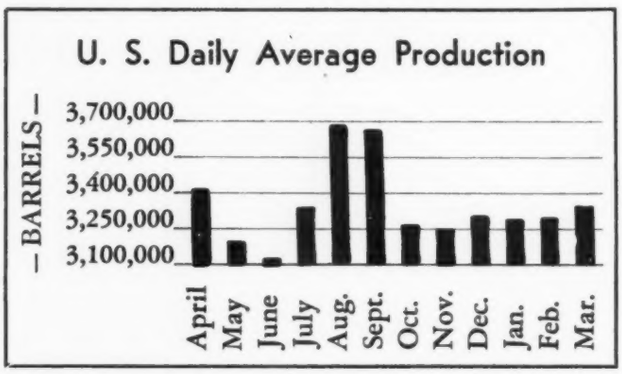
DOWELL INCORPORATED

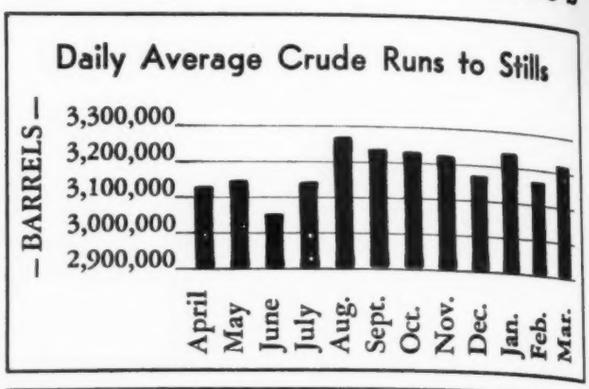
General Office: KENNEDY BUILDING, TULSA, OKLAHOMA
Subsidiary of THE DOW CHEMICAL COMPANY

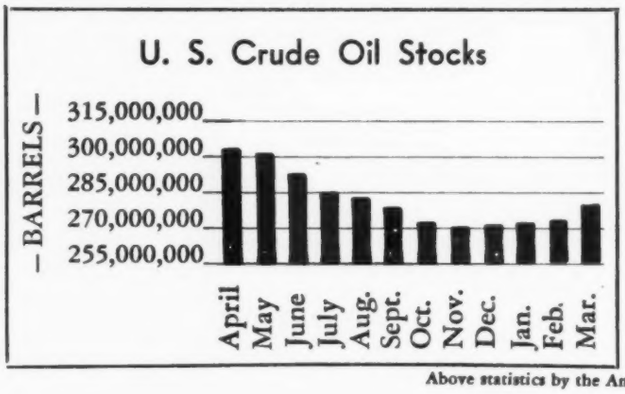
DOWELL

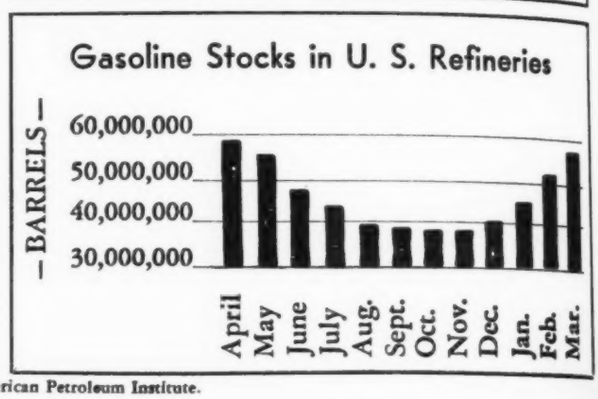
OIL AND GAS WELL CHEMICAL SERVICE

Petroleum Statistics and Field Activities









Above statistics by the American Petroleum Institute.

Summarized Operations in Active Fields for March, 1939

Fields	Completions	Producers	Rigs	Drilling Wells	Depth of Production	No. Casing Strings	Gravity of Oil	Type of Tool Used
Texas								
East Texas	33	33	5	12	3500-3700	2	40	Rotary
Duval County	36	23	3	10	1554-2900	2	22	Rotary
Ector County	40	40	9	53	3675-4377	2 and 3	32-36	Rot.-Cab.
Panhandle	21	20	28	75	1700-3900	2	40	Rotary
Refugio County	13	13	1	3	4900-5900	2	38	Rotary
Nueces County	21	19	3	7	3922-5878	2 or 3	21-54	Rotary
Winkler County	9	9	1	11	2850-3450	2 and 3	30-38	Rot.-Cab.
K. M. A. Field	26	25	25	39	3730-3935	2	42-43	Rot.-Cab.
Oklahoma								
Oklahoma City	3	2	1	4	6450-6682	3	39	Rotary
Fitts Pool	15	12	2	18	1800-4488	2 or 3	38	Rotary
Kansas								
Russell County	10	9	5	19	2926-3435	2 and 5	32-37	Rot.-Cab.
Rice County	8	6	6	23	3222-4085	2 and 5	42-48	Rot.-Cab.
Barton County	12	10	5	18	3290-3518	2	39-42	Rot.-Cab.
Illinois								
Central Illinois	239	201	47	326	1425-4100	2	36-38	Rot.-Cab.
New Mexico								
Lea County	34	32	21	68	3150-4030	3	30-34	Rot.-Cab.
California								
Kettleman Hills	1	1	6	11	8300-8730	3 or 4	40	Rotary
Wilmington	9	9	6	18	3500-4000	2 and 3	18-20	Rotary

Field Activities by States for March, 1939

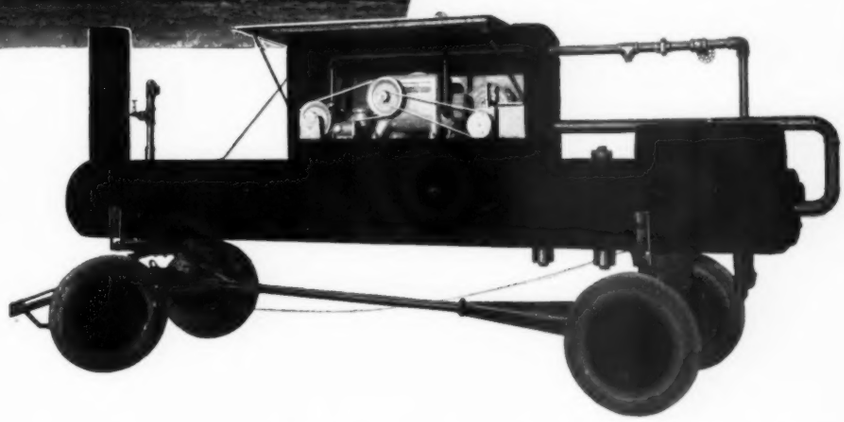
State	Completions		Producers		Locations		Rigs		Drilling Wells		Production, 1938 (In Barrels)
	March	February	March	February	March	February	March	February	March	February	
Arkansas	17	18	13	9	19	17	16	14	24	26	18,211,617
California	73	67	55	55	39	63	72	53	163	124	249,918,001
Colorado	1	0	1	0	....	....	2	0	28	26	1,371,687
Illinois	181	243	160	200	64	40	133	223	42	61	23,306,000
Indiana	6	15	1	8	10	8	2	10	43	17	965,900
Kansas	74	109	55	79	123	86	36	22	146	136	58,795,545
Kentucky	43	42	26	21	....	....	4	4	98	92	5,828,650
Louisiana	69	72	41	54	91	130	57	63	149	194	94,941,537
Michigan	86	91	58	45	112	85	39	33	157	124	19,140,966
Mississippi	0	1	0	0	....	....	8	2	2	0	Gas. Prod.
Montana	6	14	3	11	....	....	7	5	56	46	4,858,458
New Mexico	42	49	36	42	....	....	15	10	129	132	39,902,263
New York	31*	33*	31*	30*	....	....	4	2	5	3	5,040,600
Ohio	56	68	44	46	....	....	27	14	92	102	3,292,100
Oklahoma	149	134	103	82	191	141	39	33	262	219	171,312,098
Pennsylvania	84*	82*	76*	76*	....	....	....	....	....	....	17,431,500
Texas	681	795	509	586	1149	880	268	176	896	743	473,304,662
West Virginia	46	27	38	24	....	....	10	12	75	86	3,700,375
Wyoming	8	7	4	6	....	....	8	4	63	53	19,005,638
Total	1653	1867	1254	1374	1798	1450	747	680	2430	2178	1,206,827,597

*Includes water-intake and pressure wells.

SMOKE
—OR MONEY IN THE BANK?

NO "Tank Bottoms"

— when the oil is treated with a BRIDGEPORT-PRATT PORTABLE TREATER



When tanks are located at several places on the lease this portable treater is handily moved from place to place for treating the contents of receiving tanks before the oil is delivered to the pipe lines.

When thus used as the continuous treating medium, emulsions which accumulate as unsaleable oil or "tank bottoms"—when conventional heating, settling and washing processes are used—are eliminated. Waste oil, which is ordinarily burned or otherwise disposed of, is not allowed to accumulate in tanks when this treater is used.

Bad oil need not present a troublesome disposal problem, nor be sent up in smoke with a Bridgeport-Pratt Portable Oil Treater on the lease. Every barrel of oil saved is "money in the bank", particularly from those properties producing less than the pipe line allowable.

This Treater coordinates the functions of heat, circulation (washing), chemical treatment and scientifically applied vibration in the treatment of oil emulsions.

Phone or contact our nearest representative for additional information and specific recommendations on the handling of your treating problem.

BRIDGEPORT

THE BRIDGEPORT MACHINE CO. Factory and General Offices, Wichita, Kan.

Activities in Refining

Percent Refining Capacity Operated

Western Division, 66.9 Percent **Central Division, 78.8 Percent** **Eastern Division, 77.3 Percent**

ANGLO-CANADIAN Oils, Ltd., has announced its plan to install a cracking unit in its plant at Brandon, Manitoba, approximately 140 miles west of Winnipeg. The unit will have a capacity of 500 bbl. daily, which will increase materially the present skimming capacity of 1200 bbl. daily. The additional capacity will represent an important new outlet for Turner Valley crude oil production and will further strengthen the ability of Canadian refineries to supply the Dominion's demand for refined products.

●

A refinery now being built at Stockton, Rooks County, Kansas, will serve as an outlet for production from independent wells in Rooks and Ellis counties. Processing approximately 500 bbl. daily, the plant will specialize in production of gasoline and kerosene for tractors and other farm equipment. Crude oil will be hauled to the refinery by truck.

●

A gasoline plant is being built by Warren Petroleum Corporation in the Fairbanks field near Houston, Texas. The plant is designed for an initial capacity of 12,000 gal. per day, and provision is made for an increase to 25,000 gal. per day as additional wells are connected to the plant's gathering system.

●

Following a temporary three-week shutdown for general inspection in December, the Mount Pleasant, Texas, plant of Talco Asphalt and Refining Company has been operating at full capacity manufacturing a full line of light oil and asphaltic products. The rumor that the plant has discontinued operations is without foundation.

●

A gasoline plant and compressor equipment for recycling is being installed in the Long Lake field near Palestine, Texas, by Tide Water-Associated Oil Company and Seaboard Oil Company. The plant is designed for a throughput of 25,000,000 to 40,000,000 cu. ft. per day. Condensate production is estimated at 25,000 to 40,000 gal. per day.

Pure Oil Company is completing its plans to construct a new caustic regenerating plant in its Smiths Bluff refinery at Nederland, Texas.

●

Continental Oil Company has started construction in the Ville Platte field, southwestern Louisiana, of a pressure-maintenance plant similar to the one at Tepetate, Louisiana, built by the company in 1937. An integral part of the installation is a gasoline plant to process the gas. Additional equipment will include a desalting unit for treating the crude oil produced. Two 400-hp. compressors will be installed initially. The gasoline plant is designed for a throughput of 25,000,000 cu. ft. per day.

The company also plans to install additional equipment to improve gasoline recovery in its gasoline plant situated in the Lance field, Wyoming. Seven new compressors and additional gathering lines will be provided to increase the amount of tank vapors gathered for processing.

●

Installation of modern absorption, stabilization, and polymerization equipment has been completed recently in the Cities Service refinery at East Chicago, Indiana. The new absorbers and stabilizers provide additional plant capacity for the control of volatility of finished gasolines and provide a charging stock for the polymerization unit.

●

A complete survey has been authorized by Eagle Oil and Refining Company, Inc., to determine changes and new equipment required to increase the capacity and efficiency of its refinery at Santa Fe Springs, California. Harvey F. Nelson, president, states that the company's business has increased from 736,600 gal. in January, 1938, to 1,742,100 gal. in January, 1939—an increase of 136 percent in sales.

●

Gasoline of 125-octane rating that will have a 50 percent higher power output than present 100-octane aviation gasoline is being produced experimentally by Universal Oil Products Company in Chicago. The cost, which was $3600 a gal. when the product was first made about a year ago, is now reduced to about $50 a gallon.

Crude Runs To Stills, Gasoline, Gas and Fuel Stocks
Week Ending April 1, 1939

A.P.I. Figures

(Figures in Thousands of Barrels of 42 gal. each)

DISTRICT	Percent Potential Capacity Reporting	Daily Average Crude Runs to Stills	Percent Operated of Total Capacity Reporting	Total Motor Fuel Stocks	Total Gas and Fuel Oil Stocks
East Coast	100.0	487	73.2	22,170	6,698
Appalachian	85.9	100	78.1	3,362	725
Ind., Ill., Ky.	89.5	431	83.9	15,476	4,907
Okla., Kans., Mo.	81.6	241	70.5	7,923	3,904
Inland Texas	50.3	82	51.6	1,770	1,775
Texas Gulf	89.5	804	89.8	10,259	7,087
La. Gulf	97.3	134	92.4	2,614	1,525
No. La. & Ark.	55.0	41	74.5	543	751
Rocky Mt.	54.2	50	78.1	1,876	735
California	90.0	453	60.8	16,114	96,886
Reported	85.8	2,823	77.1	82,107	124,993
Estimated Unreported		347		5,170	2,900
*EST'D TOTAL U. S. APR. 1, '39		3,170		87,277	127,893
*EST'D TOTAL U. S. MAR. 25, '39		3,225		87,561	129,038
U. S. B. of M. *APR. 1, '38		**3,093		92,245	122,067

*Estimated Bureau of Mines' basis.
**March, 1938, daily average.

P 459.3
P 517.

THE Petroleum Engineer

APRIL, 1939

Extrusion of Gravel Pack Through Perforated Casing

Method devised for placing gravel pack in wells already producing through pipe cemented below producing zone

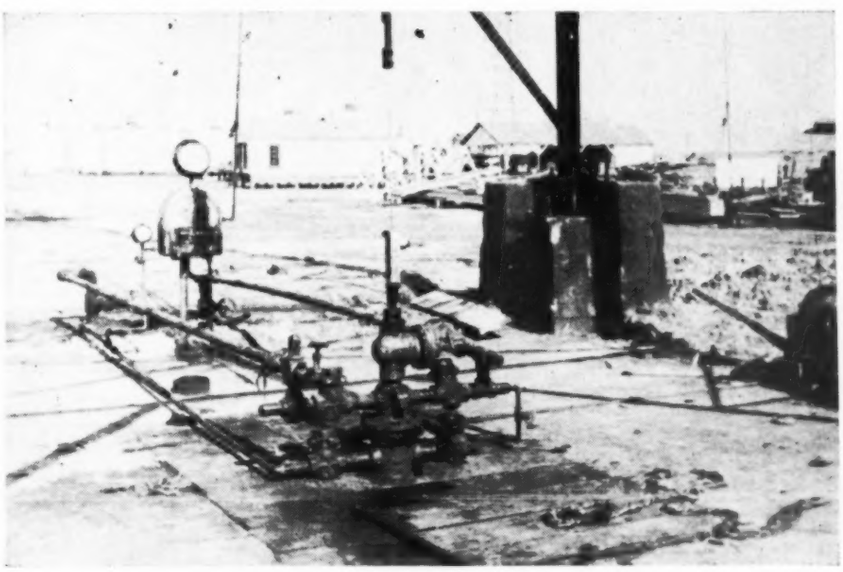
By H. LEE FLOOD
Associate Editor

THE FIELD for application of gravel-packing has definitely been enlarged by the technique recently developed on the Gulf Coast whereby gravel may be introduced through perforations in casing to pack voids in the sand otherwise inaccessible. Previously, gravel-packing has been employed only in wells where the casing was seated above the producing zone, permitting free access to the formation face for wall-scraping and packing of the gravel bed.

Gravel-packing, used for nearly 50 years in water-well conditioning, is comparatively new to the oil industry. First adapted to oil wells in the California fields about 8 years ago, gravel-packing has spread to the Mid-Continent, Gulf Coast, and other areas where difficulty is encountered in producing from fine-textured sand formations. The primary purpose of gravel-packing is to create a filter or barrier to prevent sand entering the well bore. The principal benefit resulting from the use of a gravel-pack is the elimination of the down-time and expense required to clean-out and recondition the well bore and sub-surface pumping or gas-lift equipment. The statement that increased production is one of the benefits deriving from gravel-packing is too often interpreted erroneously to mean that the *rate* of production is materially increased. It is more nearly accurate to say that the *average* production over a period of six months or a year is increased and the unit lifting cost is reduced as a result of reducing down-time for cleaning-out and reconditioning. Whether, as some assert, the daily rate of production is increased because of the greater wall area exposed by the wall-scraping attendant to the usual gravel-packing job has not been proved conclusively.

The procedure herein described as a new development in gravel-packing technique was first applied in Texas Gulf Producing Company's No. 6 Wilburn in Barbers Hill field, Chambers County, Texas. This field is about 10 miles north of Galveston Bay and about 30 miles east northeast of the city of Houston.

Wilburn No. 6 is a re-worked well. It was completed in July, 1935, at a total depth of 5426 ft. After producing from this depth for three years the well was plugged-back to a depth of 4935 ft. The casing was gun-perforated with 70 shots betweeen 4900 and 4935 ft. to obtain access to the Marginulina zone, from which oil is



The first well in which gravel-packing was accomplished by working through perforated casing to pack the cavity behind the casing

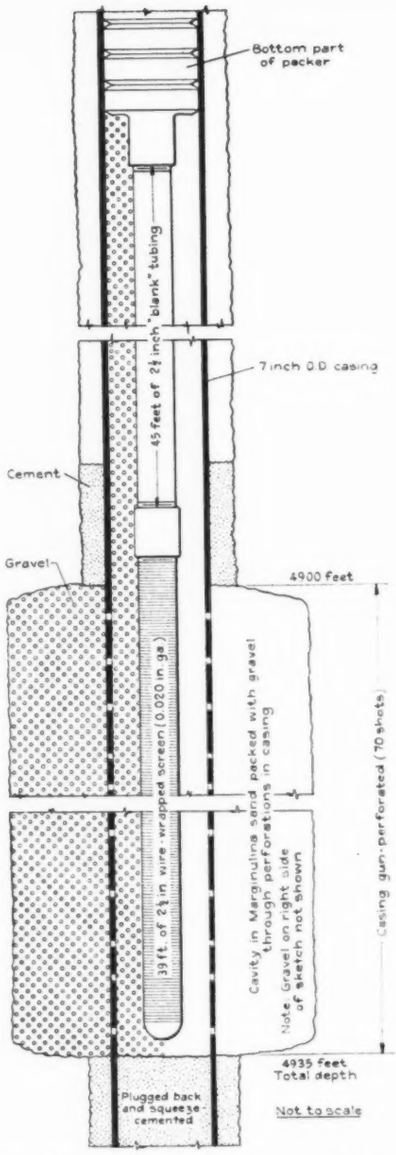
now being produced. The well produced a daily average of 109 bbl. of oil and 78 bbl. of water by gas-lift, but serious sand trouble necessitated three extensive clean-out jobs and it was finally decided to gravel-pack the well.

On Nov. 4, 1938, twelve cu. ft. of ⅛-in. gravel was packed between the 7-in. casing and the 2½-in tubing. The volume of gravel was sufficient to fill 69 ft. of the annular space between the casing and tubing. The gravel was injected into the well by reversed circulation using water as the circulating medium instead of mud. In reversed circulation the gravel-laden fluid is pumped down the casing, the fluid returning to the surface through the tubing. On Nov. 7, after the circulating water had been pumped-out, the first 24-hour gauge of oil production showed 164 bbl. of oil and 242 bbl. of water. A centrifuge test measured a production of 0.4 percent sand.

Within a week the well had sanded-up so badly that it became necessary on Nov. 13 to pull the tubing and screen. It was found that nearly all the gravel had worked itself outside the casing through the perforations. An additional 18 cu. ft. of gravel was then placed in the well in another attempt to pack only the annular space between the casing and tubing. Placed on production Nov. 18, the well produced oil and water at a rate closely approximating the original, but only a trace of sand.

By Jan. 10, 1939, the well had sanded-up again to an extent requiring attention. On that date, the screen was pulled and it was observed that the gravel had again passed to the outside of the casing. At this stage, the operators were undecided concerning the further use of gravel. Sound reasoning, however, pointed to the existence of a cavity behind the casing larger than had been realized. It was logical, also, that the practical solution would be to inject enough gravel into the well to fill completely the cavity outside the casing. The principal doubt in deciding upon this course of action was whether the gravel could be introduced through the perforations at a fast enough rate to keep the cost from becoming excessive.

With the screen out of the well, gravel was pumped into the casing through an open tubing string in 10-cu. ft. batches. After the introduction of each batch the gravel was circulated and kept in suspension by raising and lowering the tubing, and was agitated by the jetting action of a stream of water pumped through the tubing in an effort to sluice the gravel through


Bottom part of packer
45 feet of 2½ inch "blank" tubing
7 inch O.D. casing
Cement
Gravel
4900 feet
39 ft. of 2½ in. wire-wrapped screen (0.020 in. ga.)
Cavity in Marginulina sand packed with gravel through perforations in casing
Note: Gravel on right side of sketch not shown
Casing gun-perforated (70 shots)
4935 feet Total depth
Plugged back and squeeze-cemented
Not to scale

Sketch of well bore after completion of gravel-packing operations

the perforations and into the cavity behind the casing. Periodic gauges of the depth to the top of the gravel would indicate when the gravel outside the casing had equalized with the gravel inside the casing. Successive batches of gravel were placed in the well and worked into place until a gauge of the depth showed no subsidence of the last-added gravel—a fairly reliable indication that the cavity had been filled completely. When this indication had been obtained, all the gravel inside the casing was pumped-out to prepare for setting the screen in place. When the screen and tubing string had been placed, gravel was then pumped-in by reversed circulation until the 39-ft. section of 2½-in., 0.020-ga. screen was completely submerged by gravel. Enough additional gravel was placed to cover the 45-ft. section of 2½-in blank pipe immediately above the screen and to extend to the bottom of the packer attached directly to the top of the blank section. During this final stage of the gravel-packing operation the packer was held uncollapsed to permit the gravel to pass through the annular space. As the final operation, the packer was released by a 1¼-in. pipe inside the tubing rotated from the surface as a "wrench-handle". Following the setting of the packer, the 1¼-in. pipe was unscrewed from the packer and removed from the well.

The total amount of gravel introduced into the well may be summarized as follows:

Nov. 4, 1938	12 cu. ft.
Nov. 15, 1938	18 cu. ft.
Jan. 15, 1939	68 cu. ft.
Total	98 cu. ft.

Of this total amount, it is calculated that approximately 15 cu. ft. is packed between the casing and the tubing. The other 83 cu. ft. was required to fill the cavity behind the casing. If the cavity were of equal cross-section opposite all the 35 linear feet of perforated casing, the area of open hole would be equivalent to that of a circle 22 in. in diameter.

After the completion of the above work, the well started producing by gas-lift on Jan. 18, 1939. Since that date, no further sand trouble has been experienced. The well is producing currently about 75 bbl. of oil and 40 bbl. of water (under proration) but only a slight trace of sand.

Thus, through the persistence of the operators of the well, who continued the work until they obtained what appears to be a successful solution to a particularly stubborn problem, gravel-packing has been shown to be applicable to wells in which the perforated casing is seated below the producing zone. Heretofore, these wells have not been considered adapted to gravel-packing because of the difficulty of working through the perforations. Provided a cavity has been created behind the casing by the removal of sand in the normal course of production, other wells in which it is necessary to work through perforations should be as readily gravel-packed as the well herein described. Even if the cavity is not large enough to permit an adequate gravel-packing job, it should be possible to create additional space by using water at high pressure to "hydraulic" the sand. In fact, a job of this nature is in progress at present on the Gulf Coast but it is too early to know whether the work will be successful.

Factors Influencing Well Loads Combined in a New Formula

Polished-rod loads calculated by this formula do not differ greatly from actual measured loads

By KENNETH N. MILLS
Chief Engineer, American Manufacturing Company of Texas

KENNETH N. MILLS

received a B.S. degree in mechanical engineering from Rice Institute, Houston, Texas, in 1933—He joined the engineering staff of the American Manufacturing Company of Texas, Fort Worth, in 1934 and was placed in charge of that department in 1935—During his association with the petroleum industry he has devoted considerable time to the analytical study of problems encountered in oil-well pumping.

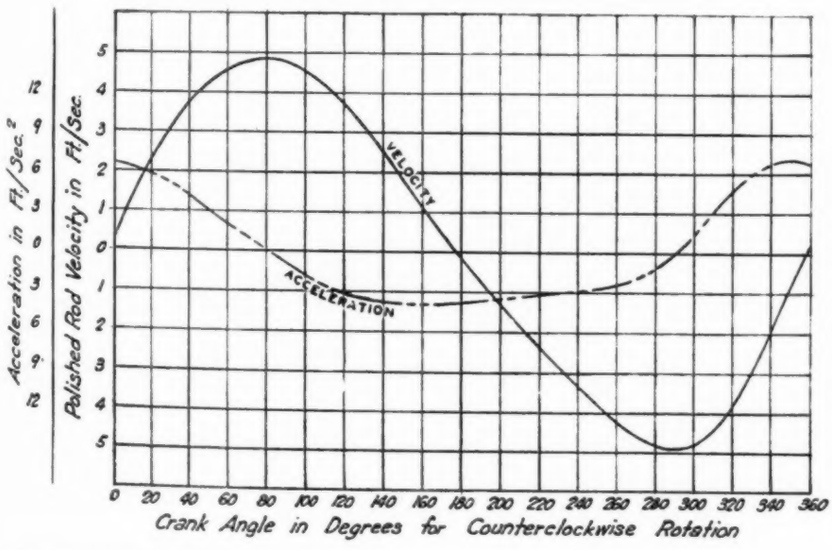
THE peak polished-rod load of any given oil well depends on the physical dimensions of the equipment used in the well, the fluid level, the condition of the well, and the relationship of the natural periods of vibrating elements of the well to the period of the pumping motion. All the well conditions being fixed, the weight of a given well is dependent on the nature of the motion imparted to the pumping mechanism.

The nature of the motion imparted to the pumping mechanism depends to a limited degree on the geometry of the pumping mechanism used. A velocity-and-acceleration curve for one type of pumping machine, its driving mechanism rotating at constant speed, is shown in Fig. 1. Inspection of this curve reveals that the motion imparted to the well is definitely not simple harmonic motion, and that the maximum acceleration occurs near the beginning of the lift part of the pumping cycle. Comparing the maximum acceleration produced by the pumping machine with the maximum acceleration calculated by assuming that the motion is simple harmonic motion reveals that, as far as the maximum acceleration is concerned, the error is not great, and that if this assumption were made in using a well load formula the error introduced should not be important.

Owing to the difference in the rates of stress transmission in the mediums responsible for most of the peak load, the entire static well load is not affected by the acceleration at the same instant. The rate of stress transmission in the sucker rods is approximately 17,000 ft. per sec. and the rate of stress transmission in the fluid is approximately 4500 ft. per sec.

If all the properties of the fluid and sucker rods except their rate of stress transmission were identical, only a small portion of the fluid mass would be accelerated during the period of peak acceleration, because of this difference. Also, the high degree of compressibility of the fluid tends further to reduce the importance of fluid acceleration, and for these reasons the fluid acceleration should contribute little or nothing to the peak well load.

Fig. 1. Velocity-and-acceleration curve for pumping unit, crank rotating at constant speed


Acceleration in Ft./Sec.²
Polished Rod Velocity in Ft./Sec.
VELOCITY
ACCELERATION
0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340 360
Crank Angle in Degrees for Counterclockwise Rotation

The formula for calculating the peak polished-rod load, assuming that the motion imparted to the well is simple harmonic motion and that the mass of the sucker-rod string is the only mass affected by acceleration is:

$$P.L = W_o + W_r\left(1 + \frac{L\,N^2}{70{,}500}\right) \quad (1)$$

Where

P.L = polished-rod load, lb.
W_o = weight of fluid, lb.
W_r = dry weight of rods, lb.
L = length of stroke, in.
N = number of strokes per min.

Table 1 includes data for a group of wells analyzed by D. G. Kingman of the General Petroleum Corporation of California to determine the accuracy of the present A.P.I. formula developed by Slonneger. The curve in Fig. 2 shows how the actual weight of the wells shown in Table 1 compares with the well load calculated by the present A.P.I. formula. The curve shown in Fig. 3 shows how the well load calculated by formula 1 compares with the actual well load. In each of these curves the dashed lines represent an

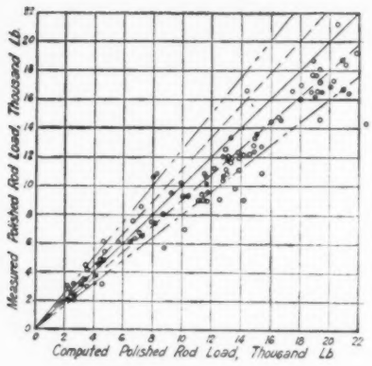


Fig. 2. Formula No. 2
(A.P.I. formula by Slonneger after D. G. Kingman)

error of 10 percent or 20 percent.

A comparison of the accuracy of these two formulas is shown in Table 2, in which the present A.P.I. formula is designated as formula 2.

Table 2

Formula	Percent of well loads in each range of accuracy		
	90 to 100 percent accuracy	80 to 90 percent accuracy	0 to 80 percent accuracy
1	58	25	17
2	36.7	43.9	19.3

From Table 2 it can be seen that the relative accuracy of formula 1 is much greater than that of the present A.P.I. well-load formula.

No simple well-load formula can be expected to be accurate because of the numerous conditions in the oil well that tend to create load. The friction created by a very crooked hole or paraffin in the tubing can increase the peak well load by 50 percent of the

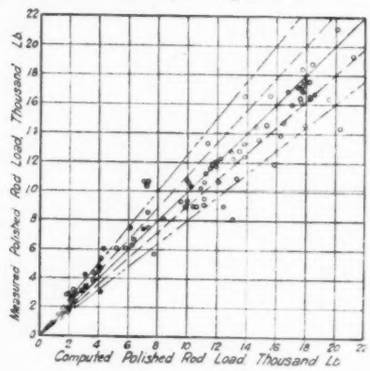


Fig. 3. Formula No. 1

theoretical load. Also, operation at a pumping speed in resonance or nearly in resonance with one of the vibrating elements of the well can greatly increase the peak well load. Until all these elements are considered, no formula can be expected to yield accurate results for all wells. If such a formula were available, it would be very cumbersome, and of little practical value.

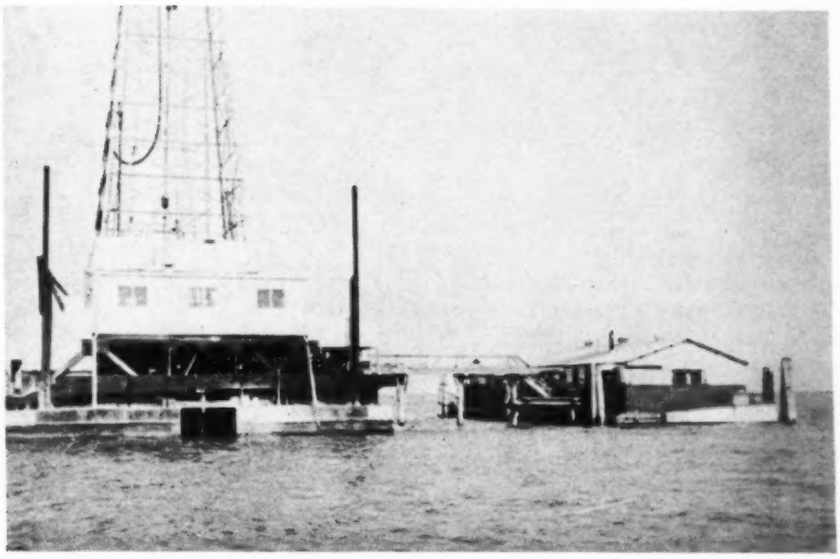
Table 1

No.	Tubing depth, ft.	Plunger size, in.	Sucker rods, ft.		Gravity of fluid, deg. A.P.I.	Strokes per minute	Length of stroke, in.	Measured loads, maximum, lb.
			⅞-in.	¾-in.				
1	3756	1 7/16		3543	28.5	24.7	41	9300
2	3668	1 15/16		3655	31.3	24.6	48¼	11850
3	3620	2¼		3620	12.2	23.5	47½	12800
4	3662	1 15/16		3647	18.2	24.3	49¼	10700
5	3704	1 15/16		3691	11.8	21.4	49½	12000
6	3763	2¼		3754	31.7	20.9	60½	10900
7	3682	2¼		3670	32.1	20.5	61¼	12700
8	1133	2¼		1124	16.0	17.0	23	3820
9	599	2¼		590	16.3	11.5	27¾	2820
10	755	2¼		746	16.8	11.7	27	2100
11	4542	1¾		4527	35.1	21.6	50	12250
12	4587	1¾		4572	28.5	23.5	50¼	13300
13	4604	1½		4589	32.8	20.5	48½	12000
14	4498	1¼	1500	2982	33.4	17.9	45½	11200
15	4555	1¼		4530	30.6	21.7	49	9500
16	4631	1½	910	3702	35.2	31.2	50	11900
17	4603	2¼	1427	3154	30.0	23.5	61½	18800
18	4603	2¼	1427	3154	28.9	23.8	62	16700
19	4627	1¾		4672	22.5	22.2	49¼	12400
20	4603	2¼	1457	3124	25.2	20.7	61	17300
21	5659	1 15/16	1760	3887	15.4	14.7	54	16900
22	5744	1¾	1471	4253	24.5	19.0	55	17200
23	5194	1¼	1500	3677	28.9	22.0	45½	16550
24	5625	1¼	2078	3533	34.4	19.4	34½	13600
25	5698	1½		5681	15.9	19.0	49	14450
26	5774	1½	1951	3808	34.2	16.3	55	16600
27	902	2¼		893	13.3	11.7	20	3150
28	617	2¾		608	13.5	13.2	22¾	2980
29	2230	2¼		2221	12.2	16.7	23½	10650
30	991	2¼		982	12.9	13.0	23	4225
31	6556	1¼	1890	4658	23.2	20.6	44½	16000
32	6767	1¼	1835	4918	26.8	20.4	56¼	17550
33	6819	1¼	1622	5180	13.2	18.5	55½	16450
34	6475	1½	2120	4339	10.5	22.7	53¼	21200
35	6886	1¼	1390	5480	32.6	21.1	55½	16460
36	2157	2 7/16		2148	15.7	17.1	35½	5700
37	719	2¼		710	13.5	17.7	23	3200
38	1999	2¼		1990	13.7	13	23	6700
39	2153	2¼		2144	13.6	17.5	35	10600
40	4510	2 7/16	1372	3123	11.1	22.6	56¼	16400
41	6940	1¼	1517	5409	34.0	19.1	56½	18450
42	7049	1 1/16	1580	5364	25.2	21.5	35¼	13850
43	7236	1¼	1507	5714	33.0	19.6	46½	14600
44	7234	1¼	1620	5598	20.6	20.7	44	16500
45	7106	1¼	2081	5009	14.8	17.5	44	16200
46	7488	1	1488*	1700*	30.0	21.7	55 1/16	14750
47	7545	1	1930	5599	22.9	20.5	54½	18130
48	7812	1 1/16		7697	21.4	20.2	55	17650
49	7708	1¼	1970	5721	20.4	21.8	54	19300
50	7801	1½		7780	26.4	19.7	54	14350
51	3209	2¼		3200	23.0	22.6	40	9050
52	3384	2¼		3375	27.1	23.8	49¼	12300
53	3209	1¾		3200	20.8	20.2	39¼	10250
54	4406	1½		4397	22.4	21.6	24½	9000
55	4514	1 1/16		4505	21.2	9.4	39	10100
56	4298	1½		4289	24.6	12.7	48¼	10800
57	4491	1¾		4480	23.0	14.4	40¼	11700
58	4508	1½		4500	22.4	9.8	40¾	10650
59	4556	1		4548	19.7	15.9	41¼	9300
60	4331	1¾		4323	23.0	13.6	40¼	10640
61	4457	1		4448	21.7	6.75	40½	9400
62	4490	1½		4481	21.0	8.32	32½	9350
63	4537	1½		4527	21.6	5.25	32½	9000
64	5227	1¼	1142†	4070	24.8	21.1	47½	10330
65	1992	2		1981	11.7	24.7	48½	6600
66	3073	1½		3055	11.5	24.2	40¾	8100
67	3508	2¼		3800	21.0	17.7	34	9000
68	3844	2		3794	10.5	20.8	49	9800
69	3844	2		3794	10.5	23	49	11100
70	3844	2		3794	10.5	24.8	49	12150
71	2080	1½		2070	26.9	23.0	31¼	6080
72	1020	2¼		1010	14.0	4.2	21	3435
73	1032	2¾		1022	14.0	5.64	16¼	4500
74	1331	2¼		1322	14.4	12.5	23¼	4700
75	1261	2¼		1252	12.7	17.0	23	4800
76	620	2¼		612	13.6	15.3	23	2880
77	768	2¼		760	14.2	12.5	20	2400
78	696	2¼		688	15.0	17	23½	2750
79	713	2¼		705	15.0	12.8	23½	2475
80	680	2¼		672	14.9	16.5	23½	2070
81	1946	2¼		1938	12.7	15	23½	6300
82	2230	2¼		2228	12.2	16.8	23½	10650
83	1989	2¼		1980	14.2	20.3	22	8550
84	1846	2¼		1838	13.9	13	22	6100
85	2159	2¼		2150	13.2	24.8	22¼	7500
86	1196	2 7/16		1188	12.8	24.5	18	6080
87	1057	2¾		1049	21.5	15.2	24	5350
88	3109	2¾		3100	17.6	21	34	8100
89	1477	2¾		1469	14.3	19.2	23	7500
90	5035	1½		5025	26.0	9.6	55½	13300
91	2581	2½	1272	1230	14.7	25.4	54½	12620
92	2893	2½		2885	17.8	26.4	47½	11850
93	3305	2		3295	15.0	28.9	57	11100
94	942	2 7/16		934	13.5	31	24	4370
95	1599	1¾		1590	15.1	13.7	31½	3100
96	2900	1¾		2890	26.4	7.5	30	7400
97	2400	2½		2390	41.9	16.4	44¾	6950
98	3536	1¾		3527	18.6	21	54½	9000
99	6058	1½	1470	4573	22.1	19.2	49½	16900
100	5988	1½		5978	28.9	24.7	33½	14600

*4300 ft. of ⅝-in. rods in addition to rods shown.

†⅝-in rods instead of ⅞-in. as shown.

Drilling and power barges on location



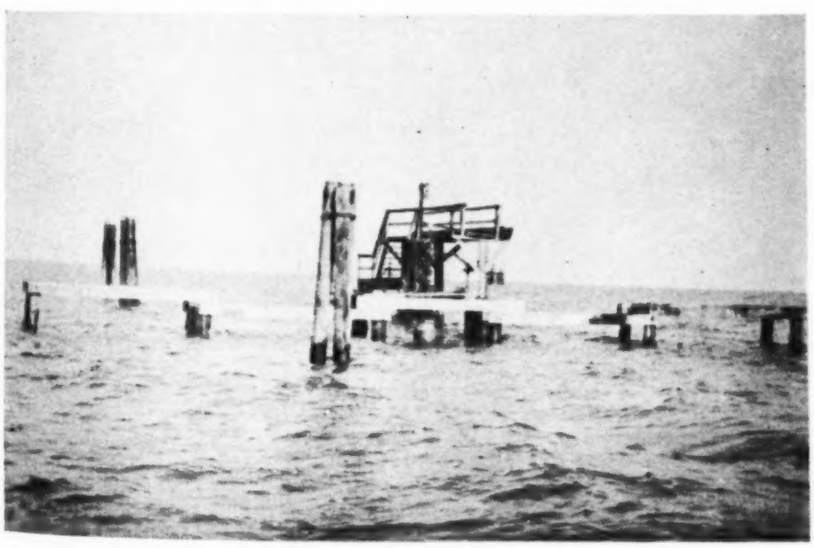
By H. LEE FLOOD
Associate Editor

Submersible Steel Barge Supports Rig And Equipment For Marine Drilling

Piling is used to guide barge and to protect completed well. Suction dredge clears channels for water transportation to location

ONE phase of oil development operations in the Gulf Coast area that is increasing in importance is the drilling of wells in navigible waters. One area being developed entirely by marine drilling is Cedar Point field, situated in the north edge of Galveston Bay, about 1½ miles offshore from Houston Point, Chambers County, Texas. The discovery well in this field was completed by Standard Oil Company of Texas and Salt Dome Oil Corporation on February 10, 1938. This well and two others were drilled from piling substructures. The fourth and subsequent wells have been drilled from a submersible barge. At the present time the companies are drilling the ninth well—the sixth to be drilled from the barge. All wells have been drilled with a Diesel-electric rig.

The points of interest, particularly to inland engineers not conversant with marine drilling procedure, are the type of equipment being used and the preliminary or auxiliary operations such as dredging, pile-driving, and hauling of supplies—all of which play a major part in the operations. Outstanding, too, is the impression one gains of the order and precision with which the work is being conducted. While one well is being drilled, another location is being prepared, and the well just completed is being protected by permanent piling.

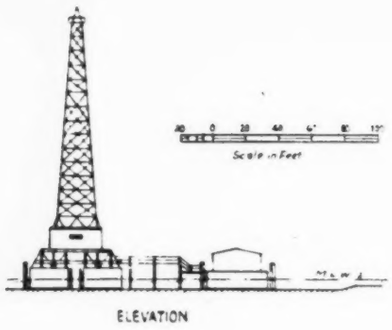


Piling pattern on well just completed

The Drilling Barge

Interest centers, of course, in the drilling barge. Built by a Beaumont, Texas, shipbuilder for Standard Oil Company of Texas and Salt Dome Oil Corporation its use is licensed from Texaco Development Corporation, owner of the basic patents covering the use of submersible barges for drilling wells. The basic design of the barge was developed in South American operations by South American interests and purchased in 1934 by Texaco Development Corporation.

The barge built in Beaumont was accepted by the owners on September 1, 1938. It consists of two steel hulls of equal size separated to provide clearance for the wellhead fittings when the barge is moved off the loca-



Sketch of barge arrangement

tion. The overall area of the entire barge is 6720 sq. ft. (56 ft. by 120 ft.). The two hulls are essentially huge box-like tanks suitably braced and reinforced inside, which may be submersed by filling with sea-water when the numerous sea-cocks are opened. When the barge is submersed and resting on the floor of the bay, its flat bottom is 6 ft. under water at low tide. The top of the tanks is 6 ft. above water.

Erected on the barge is the superstructure supporting the derrick and drilling machinery. An idea of the substantial size and bracing of the steel members in this structure may be gained from the accompanying pictures and sketches. The derrick floor is 11 ft. above the barge top; the effective height of the derrick floor above the bottom of the barge is 23 ft.

The derrick is a standard steel structure, 136 ft. in height and 30 ft. by 30 ft. at the base. The drawworks, workshop, and office are housed in a substantial building, steel-framed and covered with corrugated galvanized-iron sheeting.

In the space below the derrick floor level are installed the mud pumps, mud tanks, and auxiliary equipment. The mud-trench is a rectangular steel box extending around one end and part of the two sides of the barge. The mud returned to the surface passes through a mechanical shale-shaker, is transported through the trench to a conditioning tank, and is then passed into the suction tank ready for return underground.

The two main mud pumps are motor-driven. A smaller pump driven by a Diesel engine is provided as a standby to maintain mud circulation in the event of electric power interruption. The latter pump is also used as a transfer pump and for various odd pumping jobs on the barge.

Each detail of arrangement in the entire barge shows thought and study. One might say that every foot of space has been utilized to advantage and yet the quarters are not cramped. All the piping is elevated and easily accessible for alterations or repairs. Cranes and hoists are provided for easy moving of heavy parts. A monorail trolley is installed below-deck to facilitate the transfer of drilling tools, etc., from the barge-side to the center of the derrick.

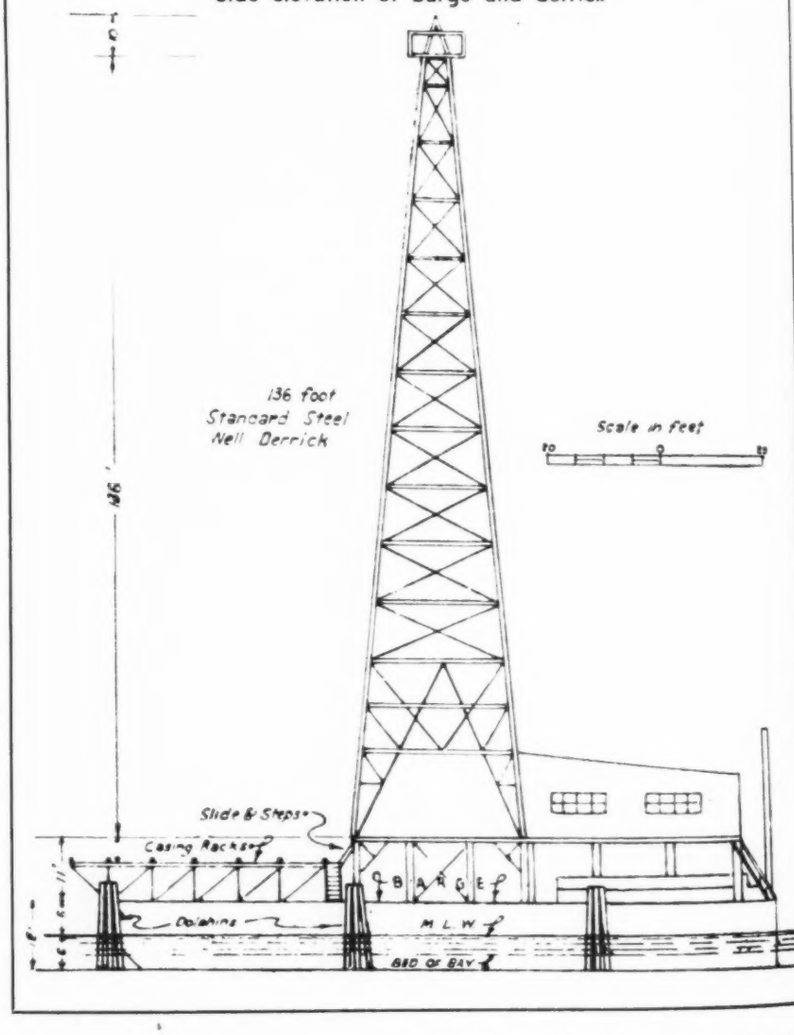
The Power Barge

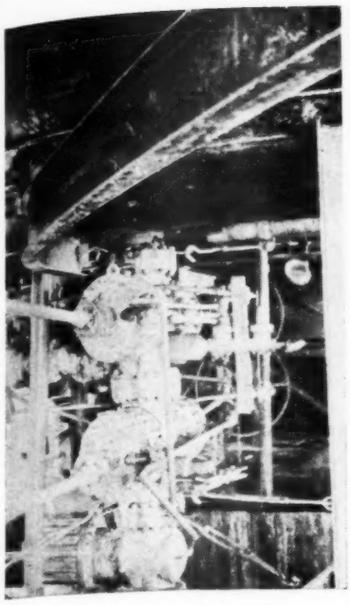
Equally a model of efficiency, the power barge houses the generating equipment. The steel hull of the barge is used as storage space for fuel oil. The 3240 sq. ft. of area (36 ft. by 90 ft.) on the barge is sufficient for an ample engine room and in addition affords comfortable office and sleeping quarters for the engineer, geologist, or others who may be "on" the well from time to time.

Description of Equipment

Generators. The prime movers driving the d-c. generating units are two 350-hp., 8-cylinder, 9-in. by 12-in. Diesel engines. Rated speed is 600 r.p.m. One engine drives a 250-kw. generator, the other a 200-kw. generator. Both generators rotate at 1200 r.p.m. The power is delivered at 200 volts. Each generator is equipped with a 20-kw., 115-volt direct-connected exciter. The Diesels deliver their power to the generators through V-belt drives. Each engine consumes 315 to 420 gal. of fuel oil and 3 to 5 gal. of cylinder oil per day. Loss of jacket water in the closed cooling system is slight; a heat exchanger is employed in the system, cooling the engine wa-

Side elevation of barge and derrick





Control valves below deck. Monorail trolley overhead

ter by exchange with sea-water pumped from the bay.

One of the principal advantages of d-c. power in drilling operations is, of course, the ability to move the extremely heavy loads from a standstill with a minimum of strain on the various machine parts. The ease of operation is gained through the use of the Ward-Leonard system of variable-voltage control to provide a high starting torque when required.

Electrical energy is transmitted from the power barge to the drilling barge through heavy flexible cables supported on the walk-way connecting the two barges. Extension cables are provided, also, for "plugging-in" the motors driving the pumps on both the water barge and the fuel-oil barge when a delivery of water or fuel is made.

Drilling and Circulating Equipment

A single drilling motor is employed to drive the drawworks and rotary table. The motor is rated at 200/400 hp., 200/400 volts, 450/900 r.p.m. A reduction gear with a ratio of 3.12 to 1 is used to drive the take-off shaft at 289 r.p.m.

The 7¾-in. x 18-in. mud pump is driven by a 300-hp. motor at 900 r.p.m. The 7¼-in. x 18-in. pump is driven by a 200-hp. motor at 900 r.p.m. In both units, the motor and pump are connected by V-belt drive. The Diesel-driven standby pump has already been mentioned. The wash-down pump and the raw-water pump are driven by 5-hp. motors, rotating at 3500 r.p.m. and 1750 r.p.m. respectively. The potential in each motor is 115 volts.

Prevention of Pollution

The one concern that is ever-present in the minds of the operators is to avoid any practice, even any accident, that would result in pollution of the bay waters. To this end, many "extra" features have been incorporated that might be termed unnecessary under normal circumstances. The most elaborate safeguard is the enormous "pan" that has been built into the drilling barge to underlay the entire working area and catch any "spills" of mud or other liquid that would contaminate the bay waters. It can be said safely that the precautions and regulations adopted by the operators in their voluntary desire to avoid pollution virtually insure against the escape of even a drop of oil or mud into the bay.

It is principally to guard against the pollution that would accompany a blowout or a well out of control that 6000-lb. valves and fittings have been used on the casing head—equipment capable of withstanding pressure far in excess of the pressure actually encountered.

Dredging and Pile-Driving Operations

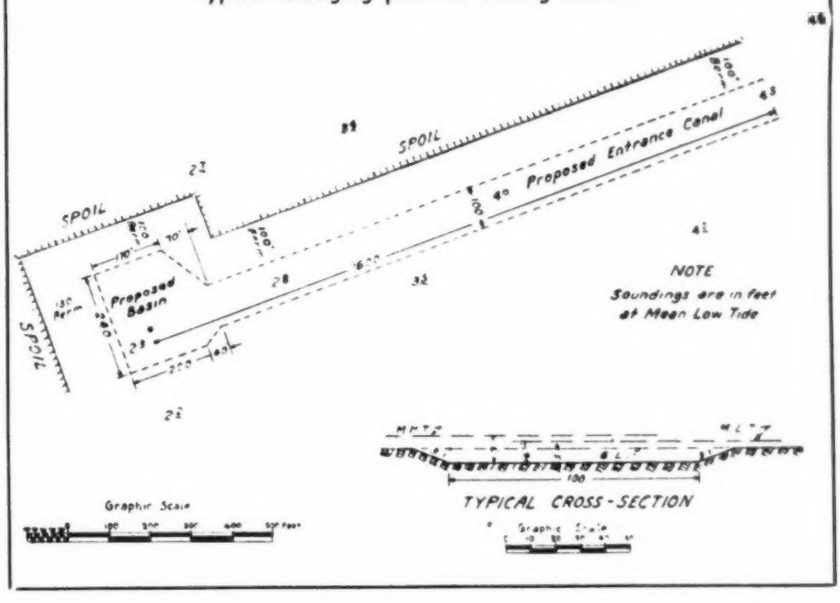
The portion of Galveston Bay in which Cedar Point field is located has a depth of 2 to 5 ft. Operation of the drilling barge, even of the lighter-draft tugs and speed-boats, in such shallow water necessitates considerable dredging in order to provide safe movement of the equipment in all stages of tide. In fact, although only 9 wells have been drilled to date, the bay in this area has already been criss-crossed with a system of channels much like a network of city streets. In other words, you must know where you are going when you start or you may run aground. Adequate flags and markers have been driven, however, to outline the course of the channels for use at night or in foggy weather. The accompanying sketch shows a typical dredging plan for one of the wells. The entrance channel is 100 ft. wide and 9 ft. deep at mean low tide. In the particular job shown in the sketch 1600 ft. of entrance channel was required. This length may vary according to location of the drilling site with relation to existing channels.

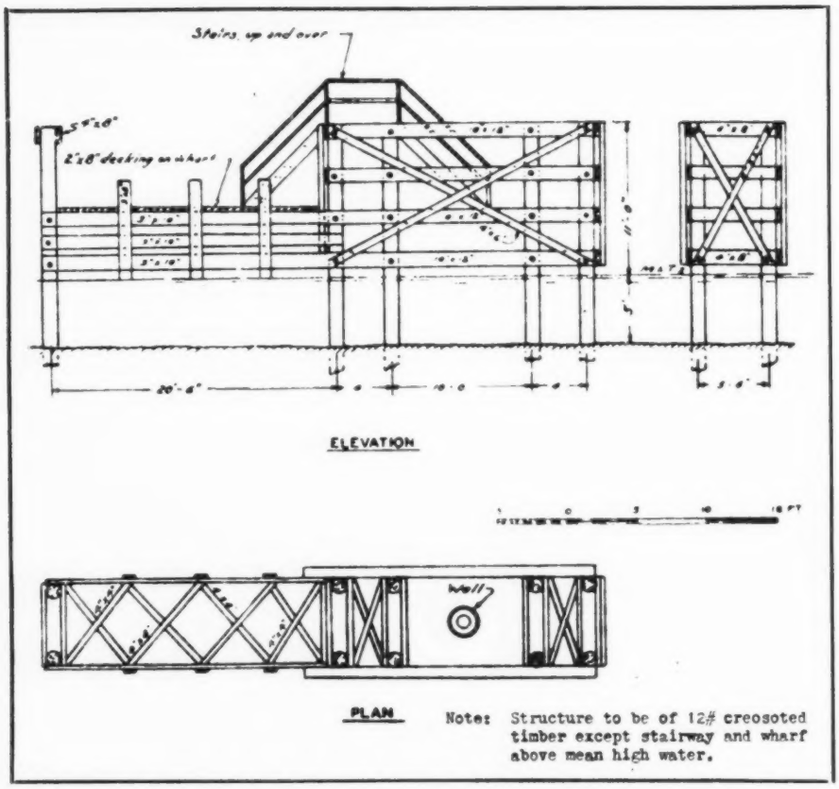
All dredging is accomplished by a large suction dredge. This type of equipment is best suited for work in open water where a large channel is to be created. By use of a long ejection pipe, the suction dredge places the spoil a considerable distance from the actual channel, preventing the moved material from being washed back into the channel. It may be noted in the sketch that the spoil bank is located to provide a 100-ft. or 150-ft. berm or shelf of normal depth at all points along the dredged channels.

The pile-driver plays an important part in the preliminary and final stages of the complete drilling operation. The various functions of this equipment are as follows:

1. To drive piling as a guide and anchor for the drilling and power barges;

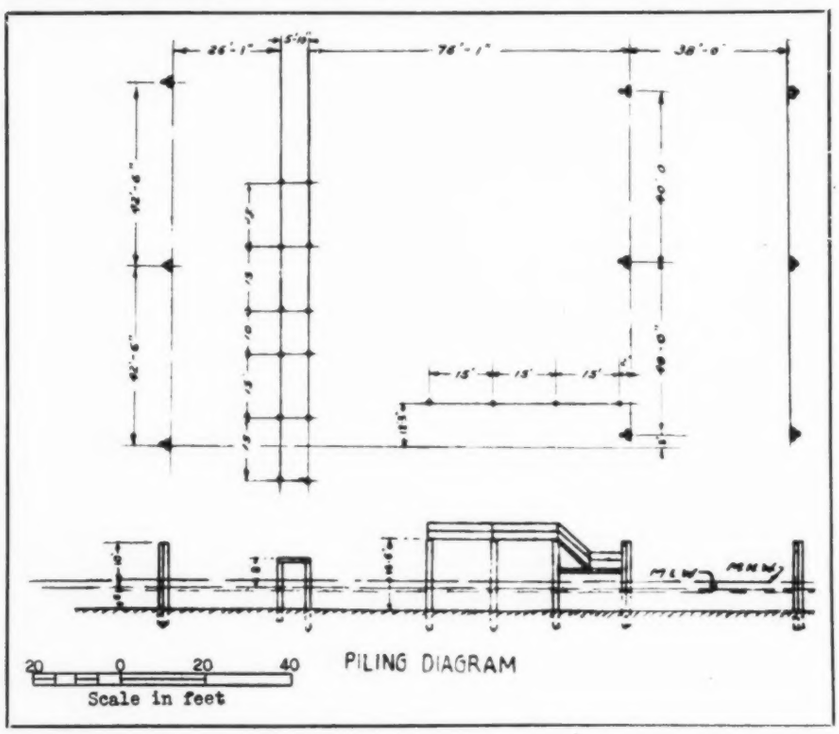
Typical dredging plan for drilling location




Stairs up and over
2'x8" decking on skids
ELEVATION
PLAN
Note: Structure to be of 12# creosoted timber except stairway and wharf above mean high water.

2. To pull (reclaim) the piling after the well is drilled; and
3. To drive the piling in the permanent structure enclosing the completed well.

A considerable saving in the cost of the necessary piling was effected by the change from piling substructures to the present drilling barge. In the former method, 150 piles 65 ft. long were required besides the considerable planking and bracing needed to complete the structure. Use of the barge cuts the number of piles required to 43. These may be shorter, too, inasmuch as they are used only as guides for the barges and are not required to support any weight. The number of piles will be further reduced to 40 by the use of a steel walkway now being built and soon to be installed. This walkway will hinge on the drilling barge, and will be raised during a move and lowered into place as drilling is started. Only one of the piles used at present as support for the wooden walkway will be driven in the future to act as a rest for the steel walkway, thereby making it independent of the slight shifting of the power barge.



Permanent piling structure to protect well-head connections

The protective structure for the completed well (or "pig-pen" as it has come to be termed by the men on the job) requires 10 piles, situated as shown in the accompanying sketch.

Other Points of Interest

It is necessary, of course, to depend upon marine equipment for all transportation to and from the well. It is interesting to note that the trucks and other equipment used in connection with cementing and electrical logging services are driven onto the water barge and towed out "intact" to the drilling barge.

The drilling and casing program in the average well is as follows:

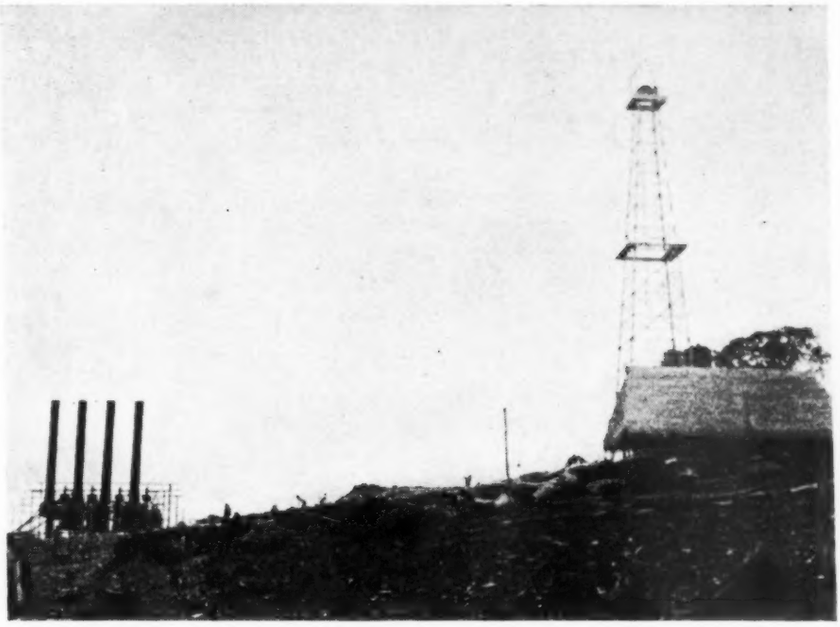
a. 150 to 160 ft. of 19½-in. hole is drilled to set 16-in. conductor casing;
b. 13¾-in. hole is drilled to set approximately 1600 ft. of 10¾-in. casing;
c. 9¾-in. hole is drilled to set approximately 6000 ft. of 7-in. casing as an oil string.

Lead lines from the producing wells farthest from the shore have been connected into a battery of oil-gas separators erected on a piling structure centrally situated in the bay. The oil from these separators flows through a 2½-in. line to a tank battery on shore. Production from the wells nearer shore is piped directly to shore where it is separated prior to entering the tanks.

At the present time, location for the tenth well is being prepared and drilling is soon to start. This well will be in the nature of an outpost test, inasmuch as it is nearly a mile west of the present producing wells. If oil production is obtained here, it will add materially to the proven acreage in the field. In any case, it will help define the pool. The eight Standard-Salt Dome wells completed to date have been producers. Of the three wells drilled by Humble Oil and Refining Company in the field, one was a dry hole.

Piling guides for moving barges on and off location

Agua Caliente No. 1-A of Blue Goose Oil Company—Boiler plant to the left



Test Well In Eastern Peru Successfully Completed

Complete rotary drilling rig and all auxiliary equipment were shipped up the Amazon waterway from the east coast of South America

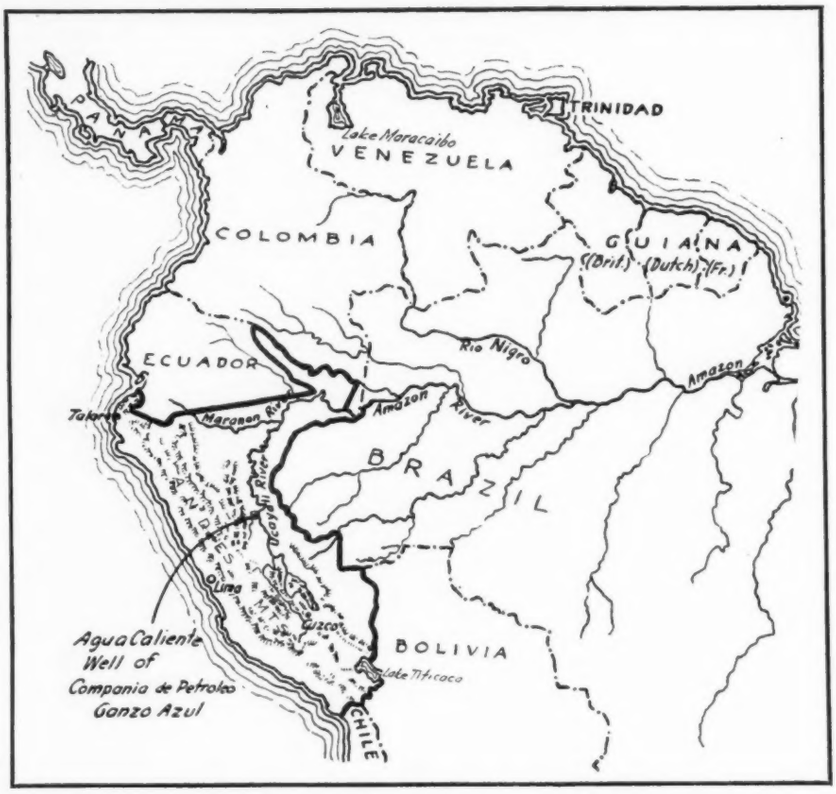
By

WALLACE A. SAWDON
Pacific Coast and Foreign Editor

BY the recent completion of a discovery well on the east slope of the Andes Mountains at the headwaters of the Amazon, another productive area has been discovered in Peru. This well, drilled for the Compania de Petroleo Ganzo Azul (Blue Goose Oil Company) by the Drilling and Exploration Company, Ltd. of Los Angeles, California, is Agua Caliente No. 1-A and proves a structure mapped ten years ago by Robert B. Moran, consulting geologist of Los Angeles. After necessary and difficult geological work was performed, the Compania de Petroleo Ganzo Azul was formed and a concession was obtained by a group of men in Los Angeles headed by William C. McDuffie. The location for a well was then made just north of the mouth of Agua Caliente Creek at longitude 74°41′5″ west and latitude 8°49′18″ south.

This location, in the Department of Loreto in eastern Peru, is 2 miles from Pachitea River. The well site is approximately 700 ft. above the river, however, and the road from the river to the well exceeds 6 miles in length and winds through jungle forests and up precipitous slopes. Over this road were hauled all the equipment and supplies, which were brought by river boats more than 3000 miles up the Amazon system from Para, Brazil, on the Atlantic seaboard. Pachitea River at Agua Caliente is itself approximately the size of Ohio River at Louisville and 9 ft. of water flows over its shallowest bar even during the dry season. The Pachitea joins Ucayali River less than 20 miles downstream from the company's landing. Approximately 560 miles below the Pachitea, the Ucayali joins Marañon River, which is generally regarded as the upper course of the Amazon.

As shown on the accompanying map, the Agua Caliente structure is approximately 500 miles southeast of the productive areas of Negritos and Lo-



Map of Peru showing location of well and the relationship of Peru to other countries and to the streams of the Amazon river system

bitos around Talara, Peru. The Agua Caliente and Talara areas, however, are geologically unrelated. The producing areas in Bolivia and western Argentina to the southeastward and those in eastern Venezuela to the northeastward include formations deposited along the shores of the Brazilian landshield and lie in the great elongated synclinorium that lies between the Archean crystalline rocks of the old land area and the great Andes Mountain System uplift.

The discovery well was the second well drilled. The first well was drilled to a depth of 3104 ft. and cut approximately 150 ft. of oil sand between the depths of 1021 ft. and 1262 ft. These sands were tested with a formation tester. To make an oil well without setting pipe, because of the possible desirability of drilling deeper later, a cement plug was set at a depth of 900 to 1000 ft.

The rig was skidded 24 ft. and a 65-ft. string of 11¾-in. surface casing was set in the second well. Below it 10⅝-in. hole was drilled to a depth of 1174 ft. and 7⅝-in. casing was run and cemented at 1020 ft.

After a Christmas tree was connected with 3½-in. internal-flush-joint drill pipe used as tubing, the well was swabbed and produced 750 bbl. per day through a ½-in. choke for a period of 7 days and 1000 bbl. per day through a 40/64-in. choke for a period of 1½ days. The well was allowed to flow for several hours through open tubing and produced at the rate of 100 bbl. per hour. The production through open casing would probably be 12,000 to 15,000 bbl. per day.

The gravity of the oil is 45 deg. A.P.I. and the well produces very little gas, flowing in the manner of an artesian water well.

The type of rig used was regarded as the most practical for wildcat drilling of this nature. During six months' drilling time there was no shut-down on account of equipment failure. The only shut-downs were caused by a few hours delay due to a simple fishing job and the loss of one day because of a shortage of fuel occasioned by the Christmas holidays. Rock bits were used exclusively in drilling both wells.

The selection of the equipment used was naturally controlled by transportation facilities, routes, and availability of fuel and water. Inasmuch as means of transportation to the location were quite adequate after a road was built from the river to the location and after unloading cranes were erected at the river port, there was no unreasonable limitation of the weight of the equipment that could be employed. The transportation of fuel oil from Para at the mouth of the Amazon was too much to consider, however, and the selection of prime movers was limited to either internal-combustion engines or steam equipment using wood for fuel. At such an isolated location as Agua Caliente it was thought that the most nearly fool-proof machinery possible was desirable, so steam-driven equipment of the least complicated type was chosen.

A careful study of heat value of the wood fuel, boiler capacity, and fire box design was necessary. A pump capable of delivering 250 hydraulic hp. at 250-lb. boiler steam pressure and a 570-hp. steam engine were selected. Around these two fundamental pieces of machinery the rig and supplies were balanced. The steam for all operations was generated by four 125-hp., 250-lb. boilers connected with a boiler feed-water unit of two 6 by 4 by 6 pumps and two 3-kw. generators. The boilers were set 42 in. off the ground, and a concrete wall 12 in. high and 6 in. thick was built beneath the side and front water legs and 48 in. beyond the rear end of the fire box. An opening for ashes and draft was built in the end, and from the top of the concrete wall grate-bar rests were hung. A fire-brick wall was then built beneath the boilers. This extended from the concrete to the fire-box side of the mud rim. Beneath the boilers a wall was erected; over the concrete wall section an arch was built.

A palm-wood wall was then built to surround the entire group of fire boxes except at the fuel-door ends; the space between this wall and the brick work was filled with soil that was thoroughly tamped. The arches were also covered in this manner. The fuel wood was cut into 4-ft. lengths to be fed into the outer door of the fire box. Inasmuch as the location was in dense tropical jungle there was plenty of fuel for the drilling job within a short distance of the well. The rig was built in very hilly country, however, so an overhead wire cable attached to a mast at the boiler plant, together with a steam winch and other necessary tackle, was used to convey logs to the boiler plant, where they were cut to proper size. During drilling operations 6 to 8 cords of wood were used each day.

Two 14 by 7¼ by 18 pumps were used, one for circulating mud and the other for mixing mud and for general service. These pumps were interchangeable and were set so as to be easily compounded to increase the discharge pressure if necessary.

Power for the rig was supplied by two 11 by 11 semi-oilbath, slide-valve, babbitted-bearing steam engines. One engine operated a 7-in. drum-shaft drawworks and the other a sand reel used for wire-line coring, swabbing, or bailing. These two engines were identical in construction and were therefore interchangeable.

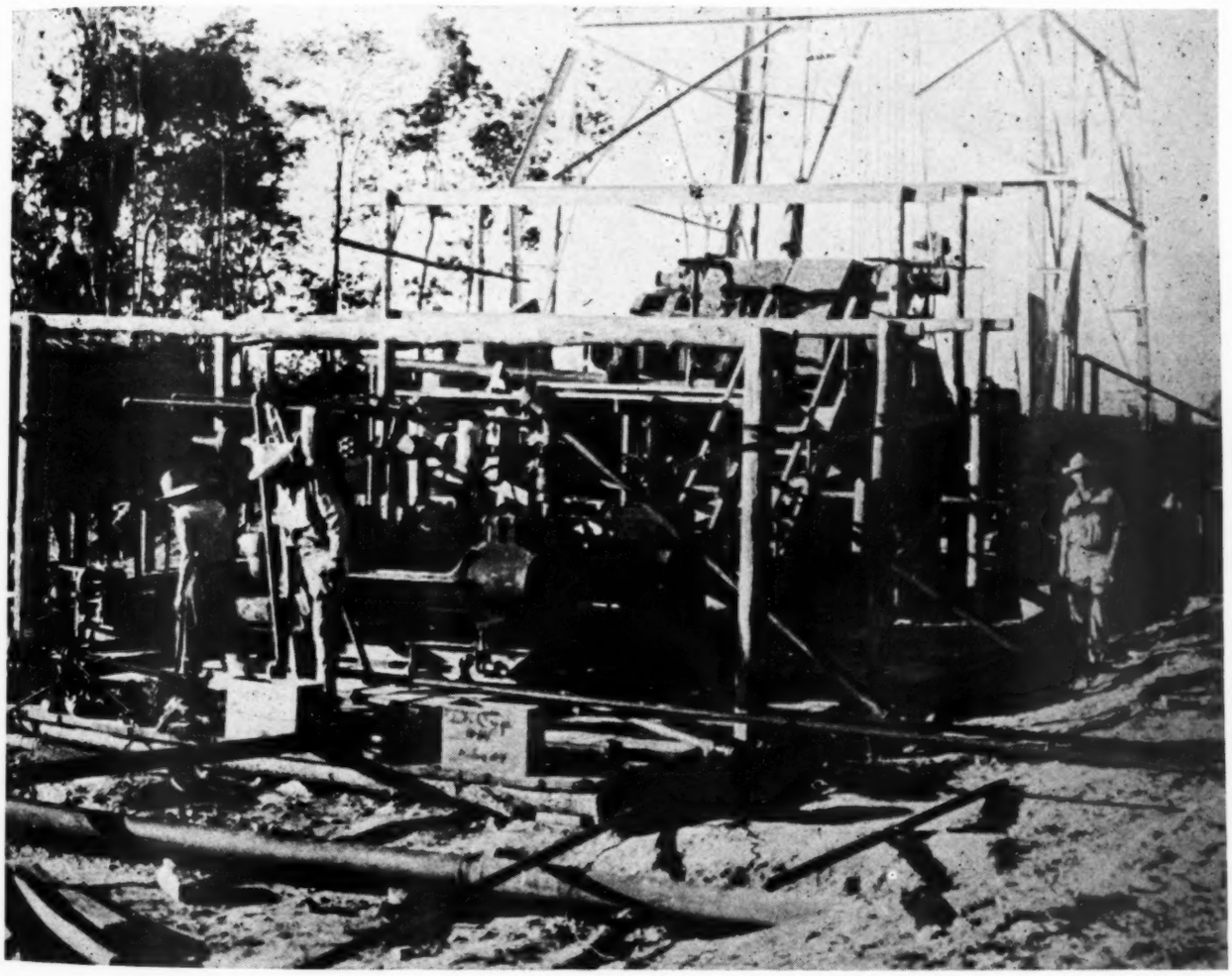
The galvanized-steel derrick was 122 ft. high and 24 ft. square at the base, had a lifting capacity of 537,000 lb., and was mounted on four steel pyramid corners. Native, hand-hewn, hardwood beams and posts were used for table and pipe-rack supports. The engine substructure was built of timber from the nearby forest. The crown block, travelling block, and hook were each of 100-ton capacity and the wire line was 1-in., steel-center, regular lay.

The drill pipe consisted of 6000 ft. of 5 1/8-in., 2000 ft. of 4½-in. for coring and rat-holing, and 8000 ft. of 3¼-in. internal-flush-joint for drilling through the 7⅝-in. casing and for use as tubing. The depth to which the rig could drill was thus 6000 ft. if the largest size drill pipe was used, and an additional 2000 ft. if the 4½-in. was also used—a total of 8000 ft. of hole. A full 90-ft. stand of drill collar in 30-ft. sections was provided for the drill pipe of each size. Kellys were 5 in. and 4 in.

All other equipment was the conventional type used in any area where excessive pressure might be encountered. The well was equipped with control gates and every precaution was taken against blowouts or any other contingency that might arise. All supplies, replacements, and repair parts were available in sufficient quantity to drill the well as it was originally planned, due consideration having been given to the fact that the location was three months from the nearest source of supply. Water was found to be good and available in quantity sufficient for all purposes. The water supply system consisted of a 40-hp. locomotive-type steam boiler, a 10 by 4½ by 10 pump, and 3-in. and 2-in. line pipe.

Equipment was transported from the port on the river to the well by two tractors with wagons and two trucks. A road-grading blade was used to maintain the road. A 5-months' supply of Diesel and gasoline fuels and lubricants was kept on hand. A motor boat and several outboard motors to propel native canoes provided a means of communication with the outside world. For construction work and for cementing casing, 100 tons of cement in air-tight containers was needed. Hand- and power-driven tools were

Rigging-up Agua Caliente No. 1-A



needed for cutting wood for fuel, and various building materials and supplies were required in camp and warehouse construction.

A 3-months' supply of foodstuffs, based on the Canal Zone rations for the United States Army, was included in the original shipment and this basis was used for determining subsequent monthly orders. Food shipped-in was augmented with local fresh meats, poultry, eggs, game, fruits, and vegetables. The river supplied plenty of fish, which were caught by drillers and crews when off tour. The fresh meat supply depended to a great extent on wild game, so several hunters were employed. For the American mess the game consisted mainly of wild hogs, deer, and several varieties of pheasant-like birds. At the Peruvian mess, which was also supplied by the operator, the favorite "piece de resistance" was the red howler or arahuata, a 30-lb. monkey whose face seemed almost human. It was rather startling to see a hunter enter camp, a grinning face looking over his shoulder.

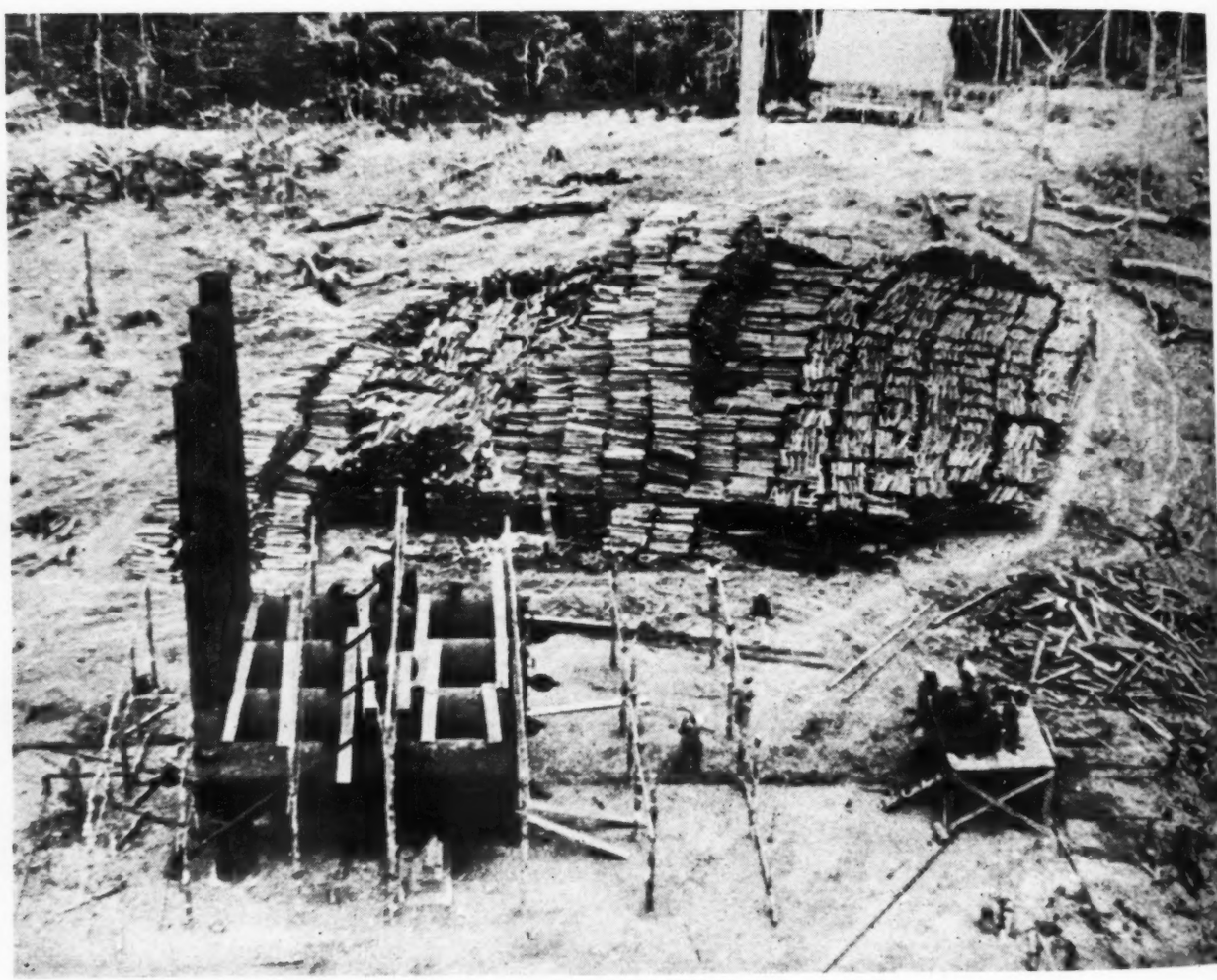
Camp equipment, in addition to the necessary bedding, cooking utensils, refrigerators, etc., included radio and phonograph. Both classical and modern airs were provided on the records, and it is interesting to note that all the men preferred semi-classical and classical music and seldom played swing.

The American personnel included a geologist, transportation superintendent, tool-pusher, two drillers, a welder and a pump and mud tender. The last-named two men were also experienced drillers. The Peruvian members of the organization were a doctor from Lima, rig helpers and roughnecks, firemen and helpers, road workers, truck and tractor drivers, and roustabouts. Though small in stature, these men, without any previous experience, made excellent workmen and were very eager to learn all they could about drilling operations.

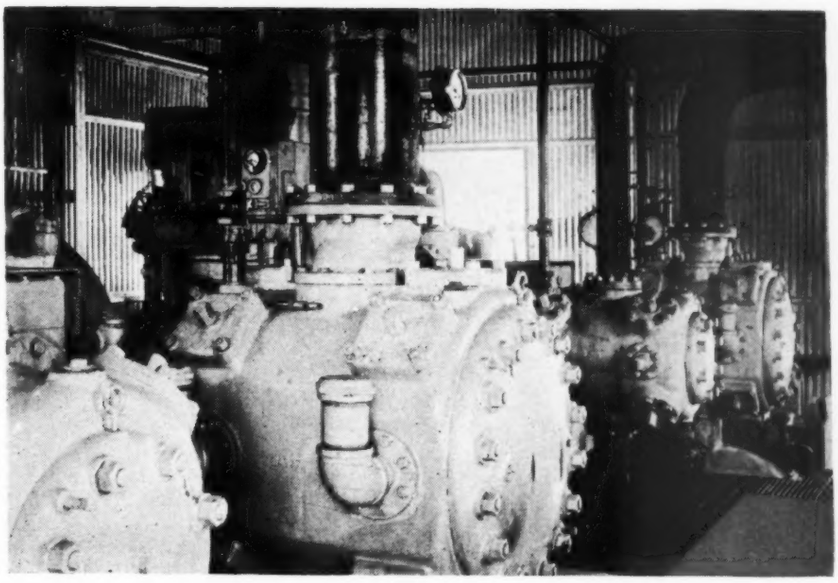
Near the surface two hours' time was required to set-back the kelly, pull the drill collar, change bits, and return to bottom. When a depth of 1000 ft. had been reached, it still took two hours to make a round trip. At 2000 ft. the same two hours was necessary. Below that depth, however, the round-trip time increased.

The American personnel going to Agua Caliente flies to Lima, Peru, from Los Angeles or Miami. The trip from Lima to the well may be made in 12 hours, using two planes and three different automobiles for the trip. The first geologist who visited the area required 28 days to get out, and that was fast time then.

Wood was used as fuel for the boilers. Here can be seen stacks of wood used for that purpose, and in the immediate foreground are the boilers



Gas is compressed to 350-lb. pressure by two 250-hp. angle-type compressors



A PETROLEUM ENGINEER FEATURE

Residue Gas From Gasoline Plant is Returned To Two Producing Sands

Meters measure gas produced on each lease, gas entering plant, and gas injected into each input well

By JO H. CABLE
Consulting Petroleum Engineer
as told to
FRANK H. LOVE
Managing Editor

OPERATORS in the Rhodes pool, Jack County, Texas, encouraged by results obtained in other fields in the Bryson area, have instituted a program of repressuring to increase ultimate recovery of oil. The casinghead gas from the 54 producing wells in the pool is being stripped of its gasoline content and the residue returned to the producing zone through 12 injection wells. For removing the gasoline content and compressing the gas to a pressure sufficient to return the gas to the producing sand a plant was placed in operation the early part of April.

The plant is a joint project of Hanlon-Buchanan, Inc., W. H. Hammon and Herbert Oil Company, Hamilton Petroleum Company, Hamilton and Hammond, and the Ohio Fuel Supply Company. The name of the operating company is the Rhodes Pool Gasoline Company. The Frick-Reid Supply Corporation constructed the plant under contract.

The discovery well of the Rhodes pool was completed early in 1937. Of the 54 producing oil wells 28 are producing from the 2400-ft. zone and 26 from the 3000-ft. zone. Both producing formations are sands in the Strawn group. None of these wells is flowing naturally; some are being pumped and some are being flowed by gas-lift. For purposes of repressuring, six injection wells were selected to return the gas to each producing zone.

Lease separators are operated at atmospheric pressure, the gas is measured by field meters on each producing

JO H. CABLE

is a graduate in mechanical engineering from Cornell University, 1919—Served in the Gulf Coast area with The Texas Company and the Gulf Oil Corporation—Dressed tools in Oklahoma for Wolverine Oil Company—Was with U. S. Bureau of Mines at Bartlesville, Oklahoma—Did repressuring work with Freeborn Engineering Company, Tulsa, Oklahoma—Transferred his activities to Wichita Falls, Texas, in 1925, opening an office as consulting petroleum engineer.

property, and the total incoming gas is measured at the recycling plant by a master meter.

Before being returned to the sand the gas is compressed to a pressure of 350 lb. by two 250-hp. angle-type compressors, each unit having three power cylinders. The low-stage compressor cylinders are 23 in. by 14 in. and the high stage cylinders 11 in. by 14 in.

Meters for measuring gas to the injection wells are so arranged that the volume injected into each well can be observed and regulated in the compressor building. Individual 2-in. lines lead from the injection-well manifold to each injection well.

Gas is received at the plant at six points vacuum and passes through a 12-in. control regulator before entering the inlet coolers, which are situated in the base of the cooling tower and consist of eight sections of 4-in. pipe welded into a 12-in. header. The gas then passes through a 5-ft. by 8-ft. vertical scrubber, and the master meter, to the low-stage cylinders of the compressor units, and is there compressed to 75 lb. The gas is discharged to the intercooler condenser, which consists of 80 ft. of 1-in. O.D., 16-gauge red brass tubes each 20 ft. long, affording an outside tube surface of 418 sq. ft. All other intercoolers, incidentally, are the same type and differ only in the total surface area. The gas then enters the high-stage compressor cylinders after first passing through the low-stage scrubber, which is a 3-ft. by 6-ft. vertical pressure vessel.

In the high-stage compressor cylinders the gas is compressed from 75 lb. to 350 lb., and is discharged through cooling condensers to the high-stage scrubber. What fuel gas is required to operate the compressor engines is diverted here, the rest going to the injection-well manifold and to the field for use in repressuring.

Gasoline is removed from the gas by the high- and low-stage scrubbers and is pumped by a 6-in. by 3-in. by 6-in. steam-driven reciprocating pump through a heat exchanger having approximately 75 sq. ft. of tube surface to the 30-tray stabilizer. The stabilizer is 2 ft. I.D. by 45 ft. 6 in. high and is operated at a pressure of 250 lb.

From the bottom of the stabilizer the gasoline is pumped through the same heat exchanger through which it entered, thence to the reflux condenser, and thence to the stabilizer for fractionation to the specified grade of gasoline. At present this grade varies from 14- to 18-lb. Reid vapor pressure. The finished product is pumped to two 10-ft. by 40-ft. horizontal storage tanks each having a capacity of 25,000 gal. Subsequently it is transported by truck to Bryson, about six miles distant, and sold to a refinery situated at that point, where it is utilized for blending.

To cool the compressor engines a closed system is employed. Each compressor unit is provided with a centrifugal pump having a 4-in. suction and a 3-in. discharge. This pump is operated off the flywheel of the engine and pumps cooling water from a supply tank situated outside the compressor building through the engine jacket to the cooling tower, whence it is returned to the supply tank. Engine-cooling makeup water is obtained from the exhaust steam line.

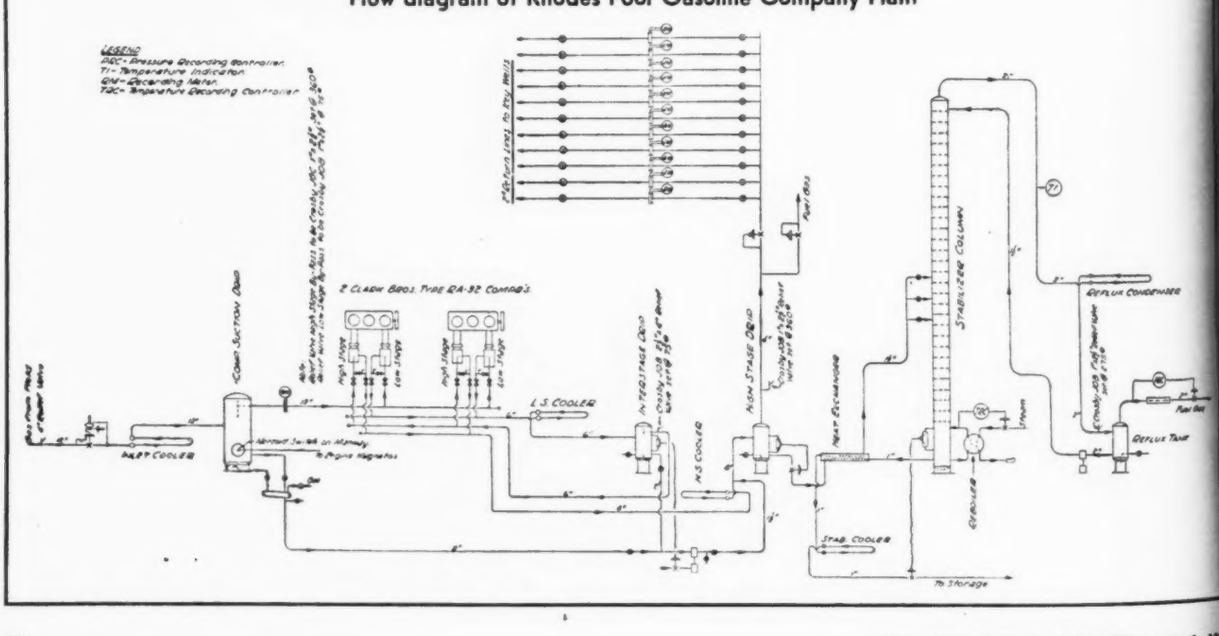
The 23-ft. by 24-ft. by 45-ft. cooling tower is designed to cool 357 gal. of water per min. from a temperature of 108° F. to 85° F. at a wet bulb temperature of 78 and a wind velocity of 3 m.p.h. Two 5-in. by 4-in. pumps, one a standby, direct-connected to 9-hp. turbines are employed to circulate water over the tower. The turbines are operating on steam at present but are so designed and arranged that they can be operated by high-pressure gas in an emergency.

Steam required in the operation of the plant is provided by a 50-hp. oil-country boiler operated at 150-lb. pressure. Electricity for plant use is generated by a 7½-kw. generator driven by a 15-hp. turbine, supplying 3-phase, 60-cycle, 110-120 volt alternating current.

Analysis of a typical gas sample from the field shows gasoline content to be 2.46 gal. per M cu. ft. The analysis reduces the gas to the following components:

Component	Mol *Percent*
Methane	78.22
Ethane	7.04
Propane	7.80
Iso-butane	.98
Normal butane	2.61
Iso-pentane	.75
Normal pentane	.98
Hexanes plus	1.62
	100.00

Flow diagram of Rhodes Pool Gasoline Company Plant



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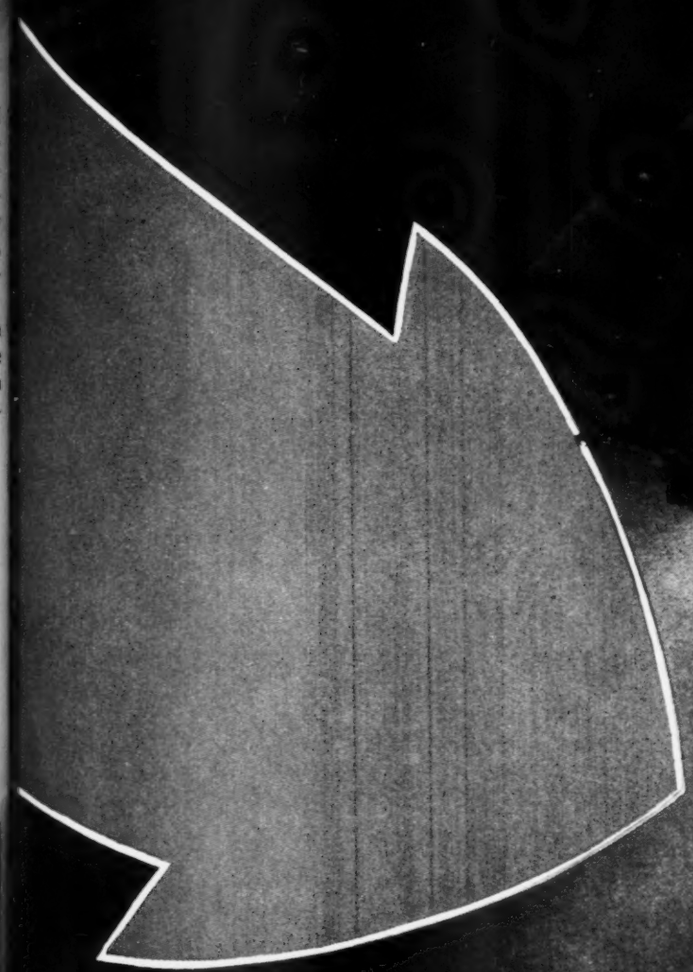
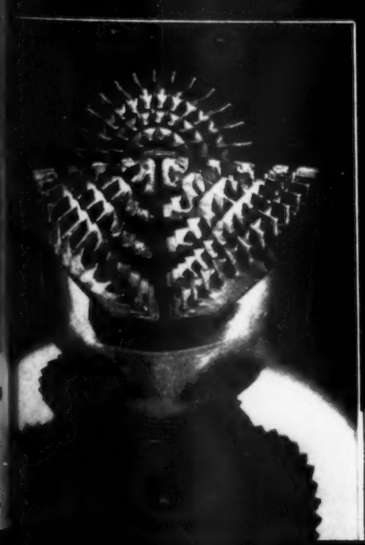


Series "H R"



Hughes Tool Co., Houston, Texas

Perforated Liner Is Gravel-Packed Before Being Placed In Well

Procedure eliminates danger of bridging or irregular distribution of gravel

A PETROLEUM ENGINEER EXCLUSIVE FEATURE

By WALLACE A. SAWDON
Pacific Coast and Foreign Editor

GRAVEL-PACKING through the producing zone to eliminate sanding and prevent collapse of the liner has been found to be definitely advantageous in the Wilmington field in California. In this field, however, wells produce from more than one zone, and between the producing strata there are formations that must be cemented-off. This has prevented the gravel-packing of more than one zone in any one well, because heretofore the gravel has been deposited around the liner after it has been set in the well. By encasing the liner with gravel before it is run, this difficulty has been overcome.

The mechanical difficulties of placing the gravel around the liner after it is set are also eliminated by the preplacement of the gravel around the pipe. For this reason the new gravel-encased liner has also been used for gravel-packing a single zone. The gravel pack is not, of course, as thick as when the gravel is deposited in a greatly enlarged hole, and any increase of production that might result from drilling a large-diameter hole cannot be obtained. Until the present time, however, this factor of increased production from large-diameter hole has not been given much consideration in the Wilmington field and does not influence the method of gravel-packing selected.

The construction of the gravel-encased liner is indicated in Fig. 1. On 6⅝-in. slotted liner the gravel encasement is 1 in. thick. The gravel is held in place around the pipe by a heavy screen, the mesh of which is just small enough to retain the smallest grains of gravel. This makes the outside diameter of the gravel-packed pipe slightly larger than 8⅝ in. In the Wilmington field the gravel generally used will pass through a ¼-in. screen and be retained on a ⅛-in. screen but gravel of any size, as determined by the grain size of the producing sand and other conditions, can be used and the retaining screen made of a mesh suitable for the size of gravel it must retain.

As can be seen in Fig. 1, the screen sections are welded together and are welded to the top and bottom of the joint of pipe that the screen encircles. At present 40-ft. joints of liner are used and are encased in gravel from top to bottom, only enough of the pipe being left uncased to allow making-up the joints with standard collars. Any type shoe can be used on the bottom of the gravel-encased string but the special type shown in distorted profile in Fig. 1 has been used on all jobs yet completed. It is understood that application has been made for a patent on the gravel-packed liner that is now being supplied, completely made-up with gravel encasement, by the Crescent Tool Company of Long Beach, California.

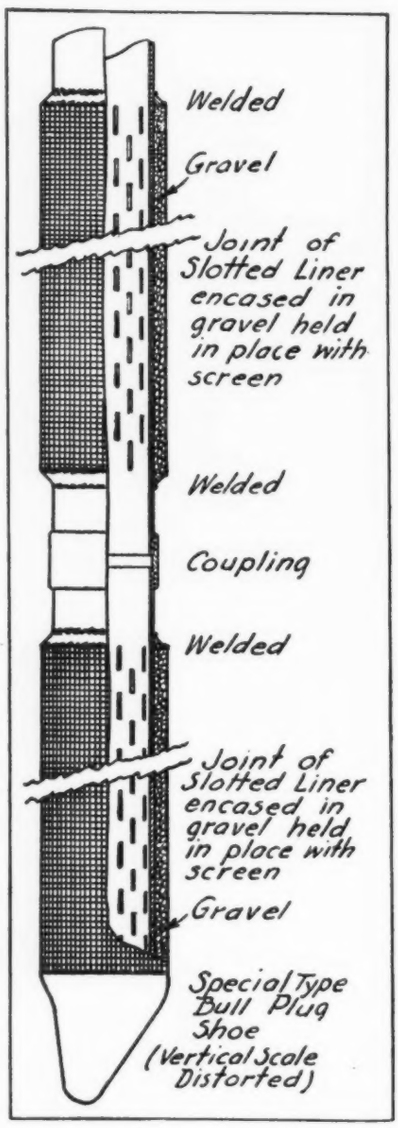


Fig. 1. Sketch showing pre-packed liner and special type shoe

The advantages and disadvantages of the use of liner made-up with the gravel placed around the pipe before it is run into the well can be realized by comparing that method with the practice of depositing the gravel around the liner after it has been set in the well. The procedures followed in the latter practice have been fully described in previous articles[1] but a brief outline of the fundamentals will indicate the salient differences between it and the use of pre-packed liner.

Wells in California have heretofore been gravel-packed only by pumping a mixture of gravel and fluid down the outside of the liner, allowing the gravel to build-up around the liner from the bottom while the fluid returns to the surface through a string of tubing attached to the liner. The tubing may extend to the bottom of the liner and take the fluid directly through a special shoe provided with a connection for the tubing, or the tubing may be connected to the liner at the top, in which case provision must be made for preventing the fluid from entering the

[1] "Gravel-Packing Oil Wells," *The Petroleum Engineer*, December, 1937, and January, 1938. "Improvements in Methods of Gravel-Packing Oil Wells," *The Petroleum Engineer*, January, 1939.

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liner on its way down the hole and denuding the gravel of its carrying fluid before it reaches its proper position around the pipe. In addition, a lubricator must usually be used to provide sufficient pressure to force the gravel and fluid to the bottom of the hole, and pumps must be employed to pump the gravel down.

This method has been very successful in gravel-packing wells in several California fields. There is, of course, the possibility of bridging the gravel or distributing it irregularly around the liner. On the other hand, the gravel pack is much thicker than when the gravel is placed around the pipe before it is run into the well. This additional thickness may be advantageous in preventing sloughing and thus protecting the walls better and reducing the hazard of collapsed liner under some conditions. The 1-in. pack around the pipe is probably sufficient to exclude the sand, inasmuch as the grains will probably be entrapped and bridge in the interstices of the gravel before penetrating the entire thickness of gravel and entering the liner. This statement cannot yet be made definite but the uniform packing of the gravel around the pipe before it is run may be more effective than a thicker pack that may not be placed so compactly when the gravel is pumped into the hole after the liner is in place.

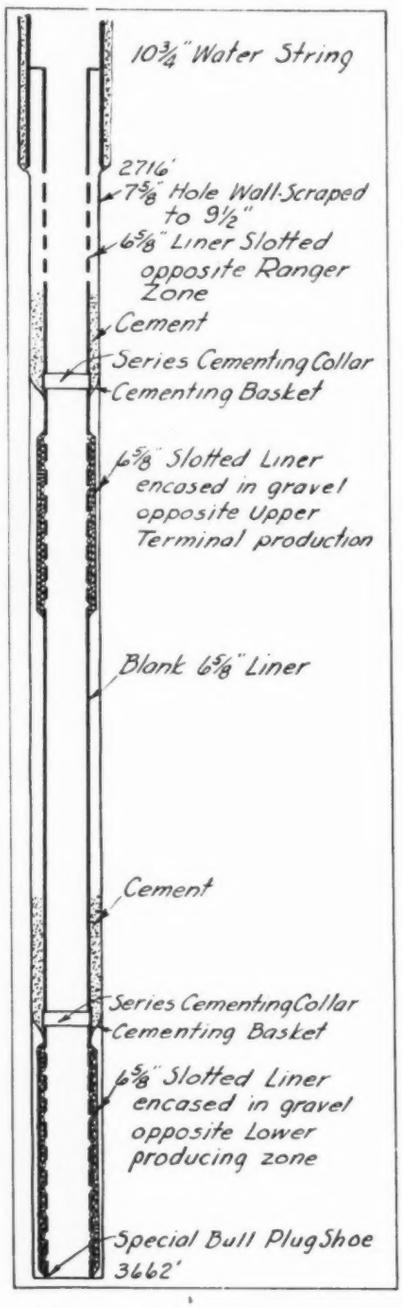
The pre-packed liner is, of course, run into the hole like an ordinary string, and after it is in place the well is ready to be cemented or completed. The hole need be scraped to a diameter only large enough to provide clearance for the gravel-packed sections of the pipe. In the wells gravel-packed by this new method the clearance has been rather small but inasmuch as no trouble has been experienced in running the liner, a straight hole properly prepared will evidently provide enough clearance even though the radius is less than ½ in. greater than the outside diameter of the encased pipe.

Although little consideration has been given to increased production that may result from the greatly increased size of hole that has been used for gravel-packing where the gravel is placed after the liner is in the hole, some operators think that when the hole has been wall-scraped to 16 or 19 in. production has been increased. For producing from some formations the increased size of hole may some day be regarded as sufficient reason for gravel-packing a well and in such wells the hole will have to be made as large as possible and the gravel placed after the liner is in the well.

Gravel-packing is still in the development stage and more experience must be obtained before completely effective procedures can be evolved. Subsurface conditions and the particular objective of the gravel-packing will have to govern the choice of method to use. In a field like Wilmington, where sand is a problem but where more than one zone offers sand trouble and intermediate strata must be cemented-off, the gravel-encased liner, which permits cementing between zones, has a definite application.

The method of gravel-packing two producing zones and cementing between the zones and between the upper gravel-packed zone and another unpacked zone above it is indicated in Fig. 2. Any method of intermediate cementing can be used but in this particular well a new method of "series cementing" was employed.

Fig. 2. Method of cementing above gravel-packed zones



After the water string had been cemented at a depth of 2716 ft., 7⅝-in. hole was drilled to the total depth of 3662 ft. This hole was then wall-scraped to a diameter of 9½ in. to permit running the liner, which was approximately 8⅝ in. O. D. where it was gravel-packed. In making-up the liner a series cementing collar and cementing basket were placed above each of the gravel-encased sections; between these two sections and between the upper one and a section of slotted pipe to lie opposite the Ranger Zone the liner consisted of blank 6⅝-in. pipe.

When the liner thus made-up was run and landed, 25 sacks of cement was placed around the pipe through the cementing collar above the lower gravel-packed section. After this job was finished, 10 sacks of cement was put through the upper collar to cement between the upper gravel-packed section and the slotted liner lying opposite the Ranger Zone. The well was then put on production and oil was produced from the two gravel-packed zones and the top Ranger Zone.

Wells in the Wilmington field may be completed by use of packers or other means to segregate the production from each of three zones or from one or two zones. In many wells the Ranger is cemented-off completely. In some, oil from two different members of the Upper Terminal Zone is produced together and this combined production is kept separate from the production from the Lower Terminal Zone. By the highly developed methods now available for cementing between producing zones, segregation of production to meet any condition is easy.

The new series-cementing method used in the well shown in Fig. 2 involves the use of cementing collars and a cementing string, which is run into the well to discharge opposite each collar. The cement is pumped through this string at whatever pressure may be necessary. The lowest cementing job is completed first, the string then being pulled upward and successively higher jobs completed without pulling the cementing string from the well until all stages are finished.

THE *Petroleum*

Engineer's

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INSTALLMENT No. 22

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Engineering Data Especially Compiled for Office, Field, and Plant Use

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A Decimal System for Classifying Data Pertaining to the Petroleum Industry

By LESTER C. UREN

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EDITOR'S NOTE: This is the fifth installment of a series of six, presenting a complete classification of petroleum technology, useful to those interested in a ready-made system for filing data concerning the petroleum and related industries. Earlier installments have appeared in the November, 1938, and January, February, and March, 1939, issues of *The Petroleum Engineer*. The ninth and tenth divisions of the Classification will be printed in a later issue.

The Petroleum Engineer is indebted to the publishers of *National Petroleum News*, owners of the copyright on the 1928 edition of the Classification, for permission to publish this expanded and modernized edition.

600 to 699. Transportation, Storage, and Gauging of Petroleum, Natural Gas, Shale Oil, Natural Asphalt, and Related Bitumens

600. General reference, text, and hand books on transportation, storage, and gauging of petroleum, natural gas, and other related products.
.1 Hazards in storing and transporting petroleum and natural gas.
.11 Fire and explosion hazards.
.12 Lightning and electrical hazards.
.2 Prevention of waste in transportation and storage of oil and gas.
601. Rail transport (in general).
602. Water transport (in general).
603. Motor-truck transport (in general).
604. Animal transport (in general).
605. Pipe-line transport (in general).
.1 Historical development of oil and gas transportation by pipe line.
.2 Costs and capital investments in oil and gas pipe lines.
.3 Government regulations and ownership of pipe lines.
.4 Profits in oil and gas pipe-line operation.
606. Storage of hydrocarbons (in general).
607. Volume and weight measurement (in general).
610. Transportation of petroleum.
611. Transportation of oil in barrels, drums, cans, and other small containers.
612. Motor-truck transportation of oil.
.1 Structural features of tank trucks for motor transport.
.2 Operation of tank trucks in motor transport of oil.
.3 Cost of motor-truck transportation of oil.
613. Railroad transportation of oil.
.1 Tank cars: structural features, capacities, types, etc.
.11 Tank cars for transport of crude petroleum and fuel oils.
.12 Tank cars for transport of gasoline and motor fuels.
.13 Tank cars for transport of butane-propane condensates.
.2 Rail loading and unloading facilities: loading racks.
.3 Regulations governing rail transport of oils.
.4 Rail shipping rates.
614. Water transportation of oil.
.1 Tank ships: structural features, capacities, types, etc.
.11 Types of tank ships; design of ocean-going "tankers."
.12 Construction of tank ships.
.13 Operation of tank ships.
.14 Choice of power for "tanker" operation.
.141 Steam power.
.142 Diesel-engine power.
.2 Barges and small vessels for use in transporting oil and oil products on inland water-ways.
.3 Loading and unloading facilities.
.31 Pier loading and unloading facilities.
.32 Off-shore or submarine loading facilities.
.33 Prevention of oil pollution of water in harbors.
.4 Water shipping rates and costs.
.5 Regulations governing water transport of oil and oil products.
.6 Hazards in water transport of oil and oil products.
.61 Fire and explosion hazards.
.62 Safety precautions.
615. Pipe-line transportation of petroleum.
.01 Cost of pipe-line transportation of oil.
.02 Gathering systems.
.03 Trunk pipe-line systems.
.1 Flow of oil through pipes: theoretical considerations.
.2 Oil pipe-line design.
.21 Pressure loss of oil in flow through pipes.
.22 Types of joints.
.221 Screw joints.
.222 Welded joints.
.223 Flexible couplings.
.23 Types of line pipe.
.231 Lap-welded line pipe.
.232 Electrically welded line pipe.
.24 Looping lines to increase capacity.
.3 Oil pipe-line construction.
.31 Trenching operations.
.311 Trench-digging machines.
.32 Laying pipe line.
.321 Pipe-laying machines for pipe with screwed joints.
.322 Welding joints of oil pipe lines.
.33 Pipe coating and wrapping.
.331 Pipe coating and wrapping materials.
.332 Pipe coating and wrapping machines.
.34 Back-filling trench.
.341 Mechanical scrapers for back-filling.
.35 Testing completed oil pipe line for leaks.
.36 Construction of telephone or other communication system along pipe line.
.4 Gravity flow systems.
.5 Pumping systems for oil pipe lines: pumping station design.
.51 Oil pumping station design and equipment.
.511 Power plant for operation of oil pipe-line pumping station.
.512 Oil pipe-line pumping equipment.
.512.1 Horizontal reciprocating pumps.
.512.2 Vertical reciprocating pumps.
.512.3 Centrifugal pumps.
.512.4 Intermeshing-gear type pumps.
.52 Cold-oil pumping.
.53 Hot-oil pumping.
.531 Oil heating equipment.
.54 The rifled pipe-line system.
.55 Automatic controls for oil pipe-line pumping stations.
.6 Pipe-line operation and control.
.61 Pipe-line dispatching and control of "runs."
.62 Blending oils to maintain uniform operating conditions.
.63 Pipe-line maintenance and repair; inspection and reconditioning.
.635 Corrosion of oil pipe lines and methods of minimizing corrosion losses.
.635.1 Soil inspection and analysis.
.635.2 Electrolytic corrosion of pipe lines.
.635.3 Pipe-line coatings and wrappings.
.635.4 Cathodic protection of pipe lines.
.64 Fire prevention in pipe-line operation.
.65 Oil losses in pipe-line operation.
.7 Common-carrier rules and regulations governing oil pipe lines. (See also under 605.3.)
.8 Oil pipe-line construction and operating costs; shipping rates.
.9 Other data pertaining to pipe-line transportation of oil.
.91 Submarine oil pipe lines.
.92 Gasoline pipe lines.
.93 Pipe-line terminals.
620. Natural gas compression and transmission.
.1 Costs of transmission of natural gas through pipe lines.
621. Flow of natural gas through pipe lines and gas compression: theoretical considerations.
622. Pipe-line design.
.1 Pressure drop in flow of gas through pipes.

.2 Types of pipe-line joints.
.21 Screw joints.
.22 Coupling joints.
.225 Flexible couplings.
.24 Welded joints.
.3 Types of line pipe.
.31 Lap-welded line pipe.
.32 Electrically welded line pipe.
.4 Looping lines to increase capacity.
.5 "Tapered" pipe lines for gas transmission.
623. Gas pipe-line construction and testing. (Subdivide as under 615.3.)
624. Compression of natural gas.
.1 "Boosters"; rotary blowers.
.2 Horizontal reciprocating compressors.
.3 Vertical reciprocating compressors.
.4 Choice of power plant for operation of gas compressors.
.5 Inter-coolers and after-coolers; louvre towers and cooling ponds.
625. Gas pipe-line operation and control.
.1 Pressure control; gas pressure regulators.
.2 Pipe-line leakage and methods of minimizing.
.3 Metering gas in pipe-line operation.
.4 Pipe-line maintenance and repair; reconditioning; inspection.
.45 Corrosion of natural gas pipe lines. (Subdivide as under 615.635.)
.5 Fire hazards and fire prevention in gas pipe-line operation.
.6 Use of pipe lines for gas storage.
629. Other data pertaining to gas transmission and compression.
.1 Corrosion of natural gas pipe-lines and methods of minimizing corrosion of pipe lines. (Subdivide as under 615.92.)
630. Transportation of solid bitumens.
631. Rail transportation of solid bitumens.
632. Water transportation of solid bitumens.
633. Motor-truck transportation of solid bitumens.
634. Animal transportation of solid bitumens.
635. Transportation of oil shale.
636. Transportation of bituminous sands.
637. Transportation of natural asphalt.
638. Transportation of mineral wax.
639. Other data on transportation of solid bitumens.
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.1 Storage of volatile distillates, condensates, and high-gravity crude oils.
.11 Storage of high-gravity crude petroleum.
.12 Storage of kerosene and burning oils.
.13 Storage of motor gasoline.
.14 Storage of natural gasoline.
.15 Storage of propane-butane mixtures and other high-vapor-pressure condensates.
.2 Storage of heavy crude petroleum, fuel oils, and lubricants.
.21 Storage of heavy crude oil.
.22 Storage of heavy fuel oil.
.23 Storage of Diesel oil.
.24 Storage of gas oil.
.25 Storage of lubricating oil.
.3 Storage cost.
.31 In steel tanks.
.32 In concrete reservoirs.
641. Storage at the well: initial storage. (See also under 541.)
.1 Flow tanks, structural features and arrangement of.
.2 Receiving sumps.
642. Central storage systems: tank farms.
.1 Arrangement of storage units in tank farms.
643. Wooden tanks.
.1 Wood-stave tanks: structural features, sizes, and capacities.
644. Steel oil-storage tanks.
.1 Corrugated steel tanks.
.2 Bolted tanks.
.3 Riveted steel-plate tanks.
.31 Tank design.
.32 Tank construction.
.33 Tank materials.
.4 Welded steel-plate tanks.
.5 Types of steel tanks.
.51 Vertical cylindrical, conical-roof tanks.
.52 Horizontal cylindrical tanks.
.53 Floating-roof tanks.
.54 Spherical tanks.
.55 Spheroidal tanks.
.56 Water-top tanks.
.57 Breather-roof tanks.
.58 Radial-cone tanks.
.59 Other types of steel storage tanks.
.6 Maintenance and repair of steel tanks.
.61 Painting of tanks.
.62 Corrosion of steel tanks.
.621 Electrolytic corrosion and its effects.
.622 Hydrogen sulphide corrosion and its effects.
.623 Cathodic protection of steeel tanks.
645. Reinforced concrete tanks.
.1 Design of concrete tanks.
.2 Construction of concrete tanks.
.3 Underground storage tanks.
646. Clay-lined reservoirs and earthen sumps for oil storage.
647. Concrete-lined and reinforced-concrete oil storage reservoirs.
.1 Design of reinforced-concrete-lined reservoirs.
.15 Roofing for reservoirs.
.2 Construction of reinforced-concrete-lined reservoirs.
648. Losses of oil during storage and means of minimizing losses.
.1 Losses due to seepage and leakage.
.2 Losses due to "breathing" and evaporation.
.21 Magnitude of evaporation loss.
.22 Reduction of tank temperature as a means of minimizing evaporation.
.221 By cooling with water sprays.
.222 By lagging or shedding tanks.
.223 By using heat-reflecting paints and metallic foils.
.224 By adoption of vapor-tight features.
.3 Losses due to fire; fire and explosion hazards.
.31 Protection against lightning and other electrical hazards.
.311 Grounded lightning-arresting towers.
.312 Grounded wire net-works.
.32 Foam protection for stored oil.
.33 Fire walls in tank farms.
.34 Maintenance of atmosphere of inert gases in tanks and reservoirs.
649. Other data on oil storage.
.1 Use of aluminum plate in construction of oil storage tanks.
.2 Warehouse storage of oil products.
650. Gas storage.
651. Use of transmission and distributing mains for gas storage.
652. Gas holders, their design, construction, and use.
653. Storage of gas by reinjection through wells into low-pressure, porous, structurally sealed strata.
654. Storage of compressed or liquefied gas in high-pressure steel tanks.
660. Storage of solid hydrocarbons.
661. Storage in underground mine workings.
662. Storage in stock piles.
663. Bin storage.
664. Storage in barrels, sacks, and other containers.
665. Storage of oil shale.
666. Storage of bituminous sands.
667. Storage of natural asphalts.
668. Storage of mineral wax.
669. Other data on storage of solid hydrocarbons.
670. Gauging and metering oil.
.1 Gauging rate of flow of oil from individual wells.
.2 Gauging oil in storage tanks or reservoirs.
.3 Gauging rate of flow of oil through pipes.
671. "Strapping" tanks and preparation of tank gauge tables.
672. Contouring reservoirs and sumps and preparation of gauge tables for reservoirs.
673. Oil gauging tanks and their use.
674. Oil meters and their use.
675. Fluid depth and water recording devices for use in oil gauging.
.1 Water-locating devices for use in gauging tanks and reservoirs.
.2 Depth gauges.
.21 Steel tapes, graduated rods, and plumb-bobs for gauging.
.22 Floating depth indicators.
.23 Pneumatic depth indicators.
.24 Electrical depth indicators.
676. Sampling petroleum. (See also under 282.)
.1 Oil thiefs and other sampling devices for sampling oil in tanks and reservoirs.
.11 Spring-actuated, bottom-closure thiefs.
.12 Bottle types of thiefs.
.13 "Core" types of thiefs.
.14 Automatic flow-line sampling devices.
.2 Care of samples; containers for shipment, etc.
.3 Methods for sampling oil in tanks.
.31 Three-point sampling method.

.32 Running-thief sampling method.
.33 "Core" sampling.
.34 Petcock sampling through wall of tank.
.35 Flow-line sampling.
.4 Methods of sampling sumps and reservoirs.

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.2 By pycnometer or specific-gravity bottle.
.3 By Westphal balance.
.4 Determination of dry gravity of oil in oil-water mixtures.
.41 Dry-gravity conversion charts.

678. Determination of water and suspended solids in oil samples.
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.12 Types of centrifuge burettes.
.13 A.S.T.M. and A.P.I. Centrifuge method for determining water and suspended solids in oils.
.2 Distillation methods; equipment used.
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.22 A.S.T.M. "water-by-distillation" method.

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680. Gauging and metering natural gas, measurement of gas volume and pressure. (See also under 281.)

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.12 Iron-case meters.
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.3 Orifice meters.
.31 Differential and static recording pressure gauges.
.32 Orifice-meter tables and charts.
.33 Radii-averaging instruments for chart conversions.
.4 Venturi meters.
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.2 Bourdon tube pressure gauges.
.3 Differential pressure gauges.
.4 Recording devices for use with pressure gauges.
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.415 Radii-averaging instruments for chart interpretation.
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685. Gas density measurement. (See also under 213.15.)
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686. Analysis of natural gas. (See also under 262.)
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.2 By explosion methods.
.3 By fractional condensation methods.
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5. Determination of specific elements and compounds in natural gas.
.51 Determination of condensable gasoline content in natural gas.
.511 Charcoal adsorption method.
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688. Sampling of natural gas and protection of samples in shipping.

689. Other data on gauging and metering gaseous hydrocarbons.

690. Methods of estimating weights and volumes of bituminous sands, natural asphalts, and other solid hydrocarbons.

691. Weighing devices for solid hydrocarbons.

692. Calculations: units of volume and weight; tables, formulas, and conversion factors for use in computing volume and weight of solid hydrocarbon substances.

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.1 Products obtained from petroleum.
.2 Refining and refinery costs.

702. General data on extraction of refined products from natural gas.

703. General data on refining of shale oil.
.1 Products obtained from shale oil.

704. General data on refining and preparation of natural asphalts.

705. General data on refining of mineral waxes.

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.2 Regional practices.

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712. Complete refineries for processing paraffin oils.

713. Complete refineries for processing asphaltic oils.

714. Wax plants.

715. Asphalt plants.

716. Natural gasoline recovery plants.

719. Other types of refineries.

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.2 Chemistry of oil refining.
.3 Catalysis of hydrocarbons.

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.2 Steam distillation.
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.2 Desulphurizing with the aid of lead salts.
.3 Desulphurizing by bacteriological methods.

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.3 Properties and sources of Fuller's earth and of clays possessing filtrative properties.
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728. Chilling and freezing processes; dewaxing.
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.2 Air cooling.
.3 Ice cooling.
.4 Liquid carbon dioxide cooling.
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729. Other refinery processes.
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.2 Filtration processes.
.3 Dehydration and demulsification processes.
.4 Electro-chemical processes.
.5 Sulphonating processes.

.6 Polymerization processes.
.7 Alkylation processes.
.8 Mechanical treatment: centrifugal separation.
730. Refinery construction, equipment, and materials.
731. Refinery lay-out and design.
732. Materials used in refinery construction.
.1 Structural steel.
.2 Sheet iron and steel.
.3 Iron and steel pipe.
.4 Refractories and heat insulators.
.5 Brick and tile.
.6 Chromium and nickel and related alloys.
.7 Copper, brass, and bronze and related alloys.
.9 Other materials.
733. Refinery buildings and structures.
734. Distillation equipment.
.1 Stills.
.2 Heat exchangers.
.3 Condensers.
.4 Temperature measuring and recording devices.
.5 Fractionating columns; dephlegmators.
.6 Vapor lines.
.7 Gas traps.
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.2 Compressed-air equipment for agitators.
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.1 Filters.
.2 Agitators.
.3 Roasting furnaces for activating Fuller's earth.
.4 Conveying machinery for charging and excavating filters.
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738. Blending and compounding equipment.
739. Other data on refinery construction, equipment, and materials.
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.12 Reservoirs. (See also under 640.)
.2 Oil transportation equipment.
.21 Oil pipe lines.
.22 Pipe-line manifolds.
.23 Oil transfer pumps.
.3 Refinery gas collecting, vapor recovery, compressing and distributing equipment.
.4 Vacuum pumps.
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.2 Continuous distilling systems.
.3 Operation of various types of stills.
.31 Crude stills.
.32 Re-run stills.
.33 Steam stills.
.34 Vacuum stills.
.35 Pressure stills.
.36 Reducing stills.
.37 Tube stills.
.4 Temperature measurement and control in distillation.
.5 Operation of mechanical agitators in distilling.
.6 Upkeep and maintenance of stills; effects of corrosion, heat, and pressure.
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.1 Corrosion of condenser coils, rundown lines, and distribution systems.
743. Operation and control of agitators.
744. Operation and control of clarifying and filtration equipment.
745. Wax-plant operation and control.
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747. Sampling, metering, and testing; physical and chemical control of final and intermediate products of the refinery. (See also 260.)
748. Pumping and control of oils in transit to, from, and about the refinery.
749. Other data pertaining to oil refinery operation and control. (For refinery storage of oils, see under 640 or 739.1; for refinery management, see under 768.)
.1 Maintenance of refinery equipment.
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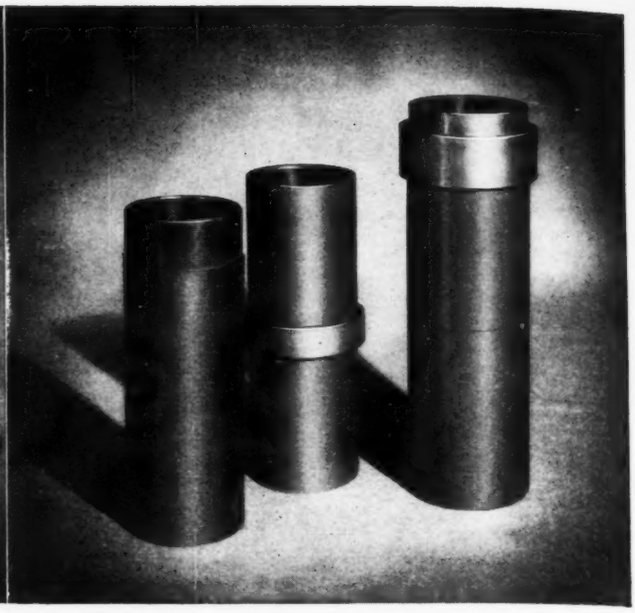
.1 Benzine.
.2 Gasoline.
.3 Engine distillate.
.4 Aromatic hydrocarbons: benzene; toluene, xylene, benzol, etc.
.5 Propane, butane, and liquid gases.
752. Illuminating oils.
.1 Kerosene.
.2 Export oil.
.3 Mineral seal oil.
.4 Signal oil.
.5 Gas oil.
753. Lubricants and related oils.
.1 Engine oils.
.2 Automobile oils.
.3 Cylinder oils and bright stocks.
.4 Machine oils.
.5 Spindle oils.
.6 Flushing oils.
.7 Cutting oils.
.8 Transformer oils.
.9 Other lubricating oils and related oils.
754. Fuel oils and related oils.
.1 Heavy fuel oils.
.2 Diesel oils.
755. Paraffin wax; wax distillates.
756. Asphalt and road oils.
.1 Paving asphalts.
.2 Roofing asphalts.
.3 Asphaltic enamels and paints.
.4 Emulsified oils.
.5 Road oils.
757. Petroleum coke.
758. Greases.
.1 Cup greases.
.2 Fibre greases.
.3 Axle greases.
.4 Cold-set rosin.
.41 Acid rosin.
.5 Soap-thickened mineral oils.
.6 Admixture of mineral oils and solid lubricants.
.7 Blends of residuum, waxes, uncombined fats, rosin oils, pitches.
.8 Lead-base and lead-containing lubricants.
.9 Miscellaneous other lubricating greases.
.91 Animal-fat—mineral-oil blends.
.92 Vegetable-oil—mineral-oil blends.
759. Other petroleum products.
.1 Petroleum and medicinal oils; petrolatum.
.2 Turpentine substitutes.
.3 Rubber substitutes.
.4 Candles.
760. Miscellaneous auxiliary plants and departments about the refinery.
761. Shops.
762. Power plant and power distribution.
.1 Steam plant.
.11 Fuels for steam generation.
.111 Fuel oil.
.112 Refinery gases.
.113 Acid sludge.
.2 Electric plant.
.3 Compressed-air plant.
763. Can factory.
764. Barrel and steel-drum factory.
765. Testing and research laboratories.
766. Packing and shipping department.
767. Store house and purchasing department. (See also under 944.)
768. Administration and management; administrative offices. (See also under 930.4.)
769. Other auxiliary plants and departments.
.1 Fire preventive and extinguishing equipment.
.11 Steam protection.
.12 Foam protection.
.13 Electrical protection; lightning protection.
.2 Communication.
.21 Signal systems.
.22 Telephone systems.
.3 Acid-recovery plant; sludge utilization.
.4 Transportation (trucking) department.
.5 Lighting systems.
.6 Water supply and distribution for the refinery.
.7 Waste disposal and utilization.
.71 Disposal, utilization of acid sludges.
.711 Reclamation of sulphuric acid from acid sludges.
.72 Utilization of refinery gases.
.73 Reclamation of tank bottoms and other heavy oil residues.
.74 Refinery sewage-disposal system.

The classification of Oil Refineries and Refinery Practices will be continued in the next issue.

FUGACITY/PRESSURE RATIO AT VARIOUS REDUCED PRESSURES AND TEMPERATURES

Reduced pressure	Reduced temperature										
	0.75	0.80	0.85	0.90	0.95	1.00	1.10	1.20	1.30	1.40	1.50
0.1	.91	.92	.94	.95	.96	.97	.98	.98	.99	.99	.99
0.2	.83	.85	.88	.89	.91	.93	.95	.96	.97	.98	.99
0.3	.75	.78	.82	.84	.87	.90	.92	.95	.96	.97	.98
0.4	.68	.72	.76	.79	.82	.86	.90	.93	.95	.96	.97
0.5	.62	.66	.70	.74	.78	.82	.87	.91	.94	.95	.96
0.6	.57	.60	.65	.69	.74	.79	.85	.89	.92	.94	.95
0.7	.52	.55	.60	.64	.70	.76	.82	.88	.91	.93	.94
0.8	.47	.51	.55	.60	.66	.72	.80	.86	.90	.92	.94
0.9	.42	.46	.51	.56	.62	.68	.78	.84	.88	.91	.93
1.0	.38	.42	.47	.52	.58	.65	.75	.82	.87	.90	.92
1.1	.34	.38	.43	.48	.54	.62	.73	.80	.86	.89	.92
1.2	.31	.35	.39	.44	.51	.58	.70	.79	.84	.88	.91
1.3	.28	.32	.36	.41	.48	.55	.68	.77	.83	.87	.90
1.4	.25	.29	.33	.38	.45	.52	.66	.75	.82	.86	.89
1.5	.22	.26	.30	.35	.42	.49	.64	.74	.81	.85	.88
1.6	.20	.23	.27	.32	.39	.46	.62	.72	.79	.84	.88
1.7	.18	.21	.25	.30	.37	.44	.60	.70	.78	.83	.87
1.8	.16	.19	.23	.28	.34	.42	.58	.69	.77	.82	.86
1.9	.14	.17	.21	.26	.32	.40	.56	.67	.76	.81	.86
2.0	.12	.15	.19	.24	.30	.38	.54	.66	.75	.80	.85
2.1	.10	.14	.17	.22	.29	.37	.52	.64	.74	.80	.84
2.2	.09	.12	.16	.20	.27	.36	.51	.63	.73	.79	.84
2.3	.08	.11	.14	.19	.26	.35	.50	.62	.72	.78	.83
2.4	.07	.10	.13	.18	.25	.34	.49	.61	.71	.77	.83
2.5	.06	.09	.12	.17	.24	.33	.48	.60	.70	.77	.82
2.6	.05	.08	.11	.16	.23	.32	.47	.59	.69	.76	.82
2.7	.04	.07	.11	.16	.22	.31	.46	.58	.68	.75	.81
2.8	.04	.07	.10	.15	.22	.30	.45	.56	.67	.74	.81
2.9	.04	.06	.10	.14	.21	.30	.44	.55	.66	.73	.80
3.0	.03	.06	.10	.14	.21	.30	.43	.54	.66	.73	.80



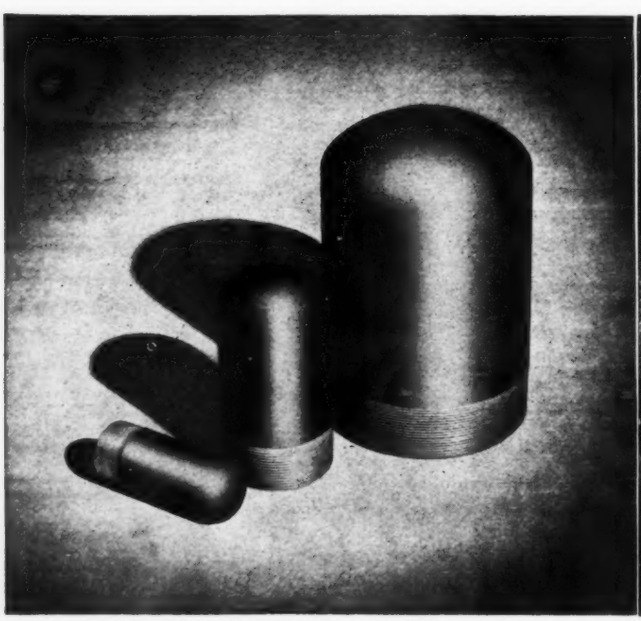
HARRISBURG COUPLINGS

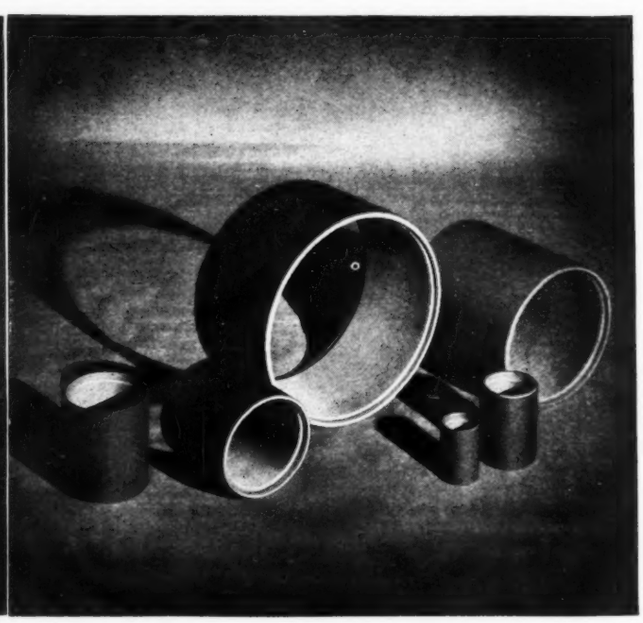
Knit Each Joint With Threads of Steel

By forging each individual coupling from a solid billet of special steel, Harrisburg produces a rugged, completely seamless unit ● Into this blank, threads unexcelled in accuracy of form, height, angle and lead are cut by a unique process, the creation of Harrisburg engineers. Strip-proof under the most adverse conditions, such threads lend added strength to couplings already proof against distortion and highly resistant to abrasion ● Quality standards attained in Harrisburg Seamless Steel Couplings are reflected in the other notable Harrisburg products: alloy and carbon steels, seamless steel cylinders, liquefiers and pump liners, hollow and drop forgings, pipe flanges, and pipe coils and bends.

HARRISBURG STEEL CORPORATION

H A R R I S B U R G • P E N N S Y L V A N I A





FLANGE BOLT AND GASKET SIZES

Series 15 or 150

Nominal pipe size, in.	O.D. of pipe, in.	O.D. of flange, in.	Thickness of flange, in.	Diameter of bolt circle, in.	Number of bolts	Size of bolts			Size of flat gasket, I.D. & O.D., in.
						Diameter, in.	Machine bolt length, in.	2-nut stud length, in.	
1	1.315	4¼	7/16	3⅛	4	½	1½	2¼	1x 2⅝
1¼	1.660	4⅝	½	3½	4	½	1¾	2½*	1¼x 3
1½	1.900	5	9/16	3⅞	4	½	1¾	2½	1½x 3⅜
2	2.375	6	⅝	4¾	4	⅝	2	3*	2 x 4⅛
2½	2.875	7	11/16	5½	4	⅝	2¼	3	2½x 4⅞
3	3.500	7½	¾	6	4	⅝	2¼	3¼*	3 x 5⅜
3½	4.000	8½	13/16	7	8	⅝	2½	3¼	3½x 6⅜
4	4.500	9	15/16	7½	8	⅝	2¾	3½	4 x 6⅞
6	6.625	11	1	9½	8	¾	3	4*	6 x 8¾
8	8.625	13½	1⅛	11¾	8	¾	3¼	4¼*	8 x11
10	10.750	16	1 3/16	14¼	12	⅞	3½	4½	10 x13⅜
12	12.750	19	1¼	17	12	⅞	3½	4¾	12 x16⅛
14	14.000	21	1⅜	18¾	12	1	4	5¼	13¼x17¾
16	16.000	23½	1 7/16	21¼	16	1	4¼	5½	15¼x20¼
18	18.000	25	1 9/16	22¾	16	1⅛	4½	6	17¼x21⅝
20	20.000	27½	1 11/16	25	20	1⅛	4¾	6¼**	19¼x23⅞
24	24.000	32	1⅞	29½	20	1¼	5¼	7**	23¼x28¼

The above dimensions agree with the 125-lb. American Cast Iron Flange Standard.

All Series 15 steel flanges are regularly supplied with 1/16-in. raised face; 125-lb. cast iron flanges are regularly supplied with flat faces.

*These studs may be ⅛ in. shorter according to certain manufacturers' specifications.

**These studs may be ¼ in. shorter according to certain manufacturers' specifications.

Series 30 or 300

Nominal pipe size, in.	O.D. of pipe, in.	O.D. of flange, in.	Thickness of flange, in.	Diameter of bolt circle, in.	Number of bolts	Size of bolts			Size of flat gasket, I.D. & O.D., in.
						Diameter, in.	Machine bolt length, in.	2-nut stud length, in.	
1	1.315	4⅞	11/16	3½	4	⅝	2	3	1 x 2⅞
1¼	1.660	5¼	¾	3⅞	4	⅝	2¼	3¼*	1¼x 3¼
1½	1.900	6⅛	13/16	4½	4	¾	2½	3½	1½x 3¾
2	2.375	6½	⅞	5	8	⅝	2½	3½	2 x 4⅜
2½	2.875	7½	1	5⅞	8	¾	3	4*	2½x 5⅛
3	3.500	8¼	1⅛	6⅝	8	¾	3¼	4¼*	3 x 5⅞
3½	4.000	9	1 3/16	7¼	8	¾	3¼	4⅜*	3½x 6½
4	4.500	10	1¼	7⅞	8	¾	3½	4½*	4 x 7⅛
6	6.625	12½	1 5/16	10⅝	12	¾	3¾	4¾	6 x 9⅞
8	8.625	15	1⅝	13	12	⅞	4¼	5½	8 x12⅛
10	10.750	17½	1⅞	15¼	16	1	5	6¼	10 x14¼
12	12.750	20½	2	17¾	16	1⅛	5½	6¾	12 x16⅝
14	14.000	23	2⅛	20¼	20	1⅛	5¾	7	13¼x19⅛
16	16.000	25½	2¼	22½	20	1¼	6	7½	15¼x21¼
18	18.000	28	2⅜	24¾	24	1¼	6¼	7¾	17 x23½
20	20.000	30½	2½	27	24	1¼	6½	8	19 x25¾
24	24.000	36	2¾	32	24	1½	7¼	9	23 x30½

The above dimensions agree with the 250-lb. American Steel Flange Standard.

Lengths of bolts and studs apply when both raised faces are 1/16 in. For double male ¼-in. facings, add ½ in. to above lengths.

*These studs may be ⅛ in. shorter according to certain manufacturers' specifications.

CHAPMAN IRON VALVES

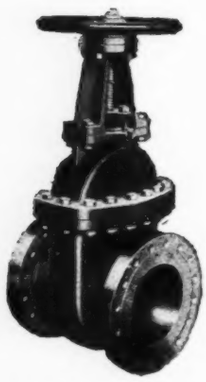
point the way

An orderly line-up of 8" and 10" Chapman Iron Valves in a natural gasoline plant.

to

STANDARDIZED

Valve Control for Oil and Gas



Iron Body, Bronze Mounted, Solid Wedge Gate Valve, 175 pounds working pressure for Oil, Water or Gas.

Chapman Iron Valves are "Thoroughbreds". Seventy years of experience and successful development, plus the best in materials and workmanship, make them so.

Every Chapman valve is built to meet maximum requirements, at the lowest cost consistent with giving continuous, trouble-free service. Nothing is left to chance. Tests are exacting. Inspection is thorough. Result—the best valve that can be produced for the purpose intended.

In addition to its complete line of iron valves, Chapman produces standard lines in bronze, steel and alloys to meet every service condition.

Plants of all types, in steadily growing number, are standardizing on Chapman valve equipment. This is good evidence of Chapman's ability to meet the complete needs of modern industries, and that it pays to "Standardize on Chapman"

Iron Body, Bronze Mounted, Double Disc, Parallel Seat, Gate Valve, 400 pounds working pressure for Oil, Water or Gas.

THE CHAPMAN VALVE

MANUFACTURING COMPANY

INDIAN ORCHARD, MASS.

PISTON SPEED, FT. PER HOUR

Stroke, in.	Revolutions per minute														
	5	10	20	30	40	50	60	70	80	90	100	200	300	400	500
3	150	300	600	900	1,200	1,500	1,800	2,100	2,400	2,700	3,000	6,000	9,000	12,000	15,000
3¼	163	325	650	975	1,300	1,625	1,950	2,275	2,600	2,925	3,250	6,500	9,750	13,000	16,250
3½	175	350	700	1,050	1,400	1,750	2,100	2,450	2,800	3,150	3,500	7,000	10,500	14,000	17,500
3¾	188	375	750	1,125	1,500	1,875	2,250	2,625	3,000	3,375	3,750	7,500	11,250	15,000	18,750
4	200	400	800	1,200	1,600	2,000	2,400	2,800	3,200	3,600	4,000	8,000	12,000	16,000	20,000
4¼	213	425	850	1,275	1,700	2,125	2,550	2,975	3,400	3,825	4,250	8,500	12,750	17,000	21,250
4½	225	450	900	1,350	1,800	2,250	2,700	3,150	3,600	4,050	4,500	9,000	13,500	18,000	22,500
4¾	238	475	950	1,425	1,900	2,375	2,850	3,325	3,800	4,275	4,750	9,500	14,250	19,000	23,750
5	250	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	10,000	15,000	20,000	**25,000**
5¼	263	525	1,050	1,575	2,100	2,625	3,150	3,675	4,200	4,725	5,250	10,500	15,750	21,000	**26,250**
5½	275	550	1,100	1,650	2,200	2,750	3,300	3,850	4,400	4,950	5,500	11,000	16,500	22,000	**27,500**
5¾	288	575	1,150	1,725	2,300	2,875	3,450	4,025	4,600	5,175	5,750	11,500	17,250	23,000	**28,750**
6	300	600	1,200	1,800	2,400	3,000	3,600	4,200	4,800	5,400	6,000	12,000	18,000	**24,000**	**30,000**
6½	325	650	1,300	1,950	2,600	3,250	3,900	4,550	5,200	5,850	6,500	13,000	19,500	**26,000**	**32,500**
7	350	700	1,400	2,100	2,800	3,500	4,200	4,900	5,600	6,300	7,000	14,000	21,000	**28,000**	**35,000**
7½	375	750	1,500	2,250	3,000	3,750	4,500	5,250	6,000	6,750	7,500	15,000	22,500	**30,000**	**37,500**
8	400	800	1,600	2,400	3,200	4,000	4,800	5,600	6,400	7,200	8,000	16,000	**24,000**	**32,000**	**40,000**
8½	425	850	1,700	2,550	3,400	4,250	5,100	5,950	6,800	7,650	8,500	17,000	**25,500**	**34,000**	**42,500**
9	450	900	1,800	2,700	3,600	4,500	5,400	6,300	7,200	8,100	9,000	18,000	**27,000**	**36,000**	**45,000**
9½	475	950	1,900	2,850	3,800	4,750	5,700	6,650	7,600	8,550	9,500	19,000	**28,500**	**38,000**	**47,500**
10	500	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000	20,000	**30,000**	**40,000**	**50,000**
10½	525	1,050	2,100	3,150	4,200	5,250	6,300	7,350	8,400	9,450	10,500	21,000	**31,500**	**42,000**	**52,500**
11	550	1,100	2,200	3,300	4,400	5,500	6,600	7,700	8,800	9,900	11,000	22,000	**33,000**	**44,000**	**55,000**
12	600	1,200	2,400	3,600	4,800	6,000	7,200	8,400	9,600	10,800	12,000	**24,000**	**36,000**	**48,000**	**60,000**
13	650	1,300	2,600	3,900	5,200	6,500	7,800	9,100	10,400	11,700	13,000	**26,000**	**39,000**	**52,000**	65,000
14	700	1,400	2,800	4,200	5,600	7,000	8,400	9,800	11,200	12,600	14,000	**28,000**	**42,000**	**56,000**	70,000
15	750	1,500	3,000	4,500	6,000	7,500	9,000	10,500	12,000	13,500	15,000	**30,000**	**45,000**	**60,000**	75,000
16	800	1,600	3,200	4,800	6,400	8,000	9,600	11,200	12,800	14,400	16,000	**32,000**	**48,000**	64,000	80,000
18	900	1,800	3,600	5,400	7,200	9,000	10,800	12,600	14,400	16,200	18,000	**36,000**	**54,000**	72,000	90,000
20	1,000	2,000	4,000	6,000	8,000	10,000	12,000	14,000	16,000	18,000	20,000	**40,000**	**60,000**	80,000	
22	1,100	2,200	4,400	6,600	8,800	11,000	13,200	15,400	17,600	19,800	22,000	**44,000**	66,000	88,000	
24	1,200	2,400	4,800	7,200	9,600	12,000	14,400	16,800	19,200	21,600	**24,000**	**48,000**	72,000	96,000	
26	1,300	2,600	5,200	7,800	10,400	13,000	15,600	18,200	20,800	23,400	**26,000**	**52,000**	78,000		
28	1,400	2,800	5,600	8,400	11,200	14,000	16,800	19,600	22,400	**25,200**	**28,000**	**56,000**	84,000		
30	1,500	3,000	6,000	9,000	12,000	15,000	18,000	21,000	**24,000**	**27,000**	**30,000**	**60,000**	90,000		
32	1,600	3,200	6,400	9,600	12,800	16,000	19,200	22,400	**25,600**	**28,800**	**32,000**	64,000	96,000		
34	1,700	3,400	6,800	10,200	13,600	17,000	20,400	23,800	**27,200**	**30,600**	**34,000**	68,000			
36	1,800	3,600	7,200	10,800	14,400	18,000	21,600	**25,200**	**28,800**	**32,400**	**36,000**	72,000			
40	2,000	4,000	8,000	12,000	16,000	20,000	**24,000**	**28,000**	**32,000**	**36,000**	**40,000**	80,000			
48	2,400	4,800	9,600	14,400	19,200	**24,000**	**28,800**	**33,600**	**38,400**	**43,200**	**48,000**	96,000			
60	3,000	6,000	12,000	18,000	**24,000**	**30,000**	**36,000**	**42,000**	**48,000**	**54,000**	**60,000**				

PLAIN TALK

to those who have never used

COOK'S PISTON RINGS

BUSINESS habits hide waste and leakage that can be stopped and turned into profit!

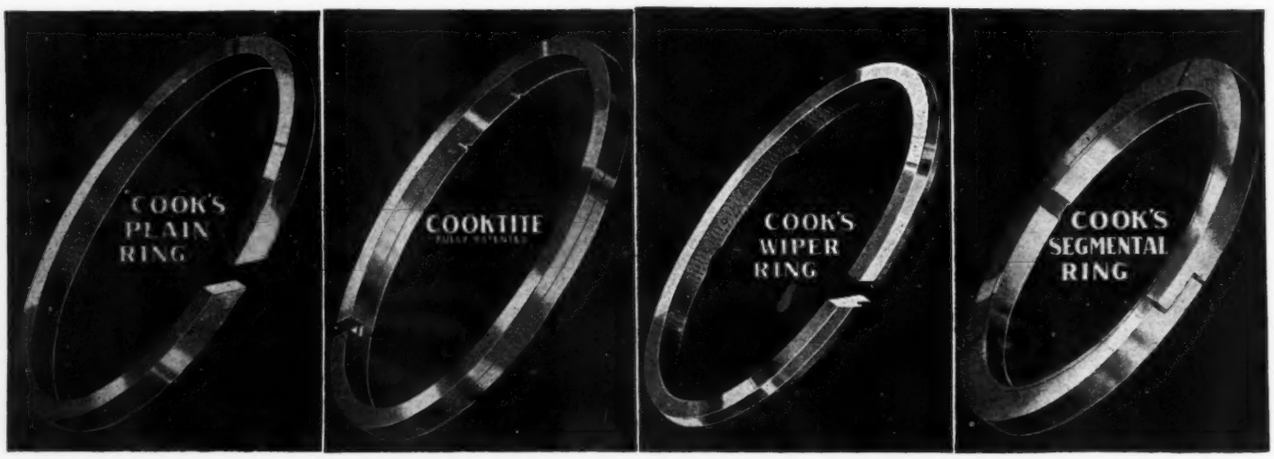
Take piston rings—buying habits may hide the waste that comes from using ordinary rings—waste due to frequent ring replacements, excessive cylinder wear, loss of pressure—waste that could be **turned into profit** by the simple expedient of **changing to COOK'S Rings.**

No longer does any engine or compressor operator have to put up with the trouble and expense of inadequate rings . . . not since COOK specialized in the development of materials and designs to meet the particular requirements of industrial size equipment.

This specialization has brought forth many improvements that are found exclusively in COOK'S Rings and that have set new standards of performance. To mention a few—**COOK'S GRAPHITIC IRON,** that imparts superior wear resisting properties — the **TINIZED** surface treatment, that speeds up "mating" of cylinder and ring surfaces and guards against scuffing of both new and worn cylinders—the **COOKTITE** ring, the only two-piece sealing ring, both members of which have full depth radial strength to impart maximum dependability and sealing effectiveness.

With a background of **fifty years' service** to the builders and operators of engines and compressors, COOK offers you a wide range of ring materials and designs engineered to meet the requirements of the modern industrial machine, and in addition an engineering service that you are welcome to use in any way it may be of help to you.

Whether or not you are in the market at the moment, you will certainly want to learn if COOK'S Rings will improve the performance of your equipment and to what extent. Ask us for specific recommendations or write for informative literature.



C. LEE COOK MANUFACTURING CO.

INCORPORATED

COOK'S GRAPHITIC IRON PISTON RINGS ● New York Cleveland Los Angeles Baltimore LOUISVILLE, KY. Chicago Tulsa New Orleans San Francisco ● Sealing Pressures Since 1888

PRESSURE OF INPUT WATER AT SAND FACE, LB. PER SQ. IN.

Depth to sand being flooded, ft.	Pump pressure, lb. per sq. in.																				
	0	25	50	75	100	125	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500
1800	781	806	831	856	881	906	931	956	981	1006	1031	1056	1081	1106	1131	1156	1181	1206	1231	1256	1281
1850	803	828	853	878	903	928	953	978	1003	1028	1053	1078	1103	1128	1153	1178	1203	1228	1253	1278	1303
1900	825	850	875	900	925	950	975	1000	1025	1050	1075	1100	1125	1150	1175	1200	1225	1250	1275	1300	1325
1950	846	871	896	921	946	971	996	1021	1046	1071	1096	1121	1146	1171	1196	1221	1246	1271	1296	1321	1346
2000	868	893	918	943	968	993	1018	1043	1068	1093	1118	1143	1168	1193	1218	1243	1268	1293	1318	1343	1368
2050	890	915	940	965	990	1015	1040	1065	1090	1115	1140	1165	1190	1215	1240	1265	1290	1315	1340	1365	1390
2100	911	936	961	986	1011	1036	1061	1086	1111	1136	1161	1186	1211	1236	1261	1286	1311	1336	1361	1386	1411
2150	933	958	983	1008	1033	1058	1083	1108	1133	1158	1183	1208	1233	1258	1283	1308	1333	1358	1383	1408	1433
2200	955	980	1005	1030	1055	1080	1105	1130	1155	1180	1205	1230	1255	1280	1305	1330	1355	1380	1405	1430	1455
2250	976	1001	1026	1051	1076	1101	1126	1151	1176	1201	1226	1251	1276	1301	1326	1351	1376	1401	1426	1451	1476
2300	998	1023	1048	1073	1098	1123	1148	1173	1198	1223	1248	1273	1298	1323	1348	1373	1398	1423	1448	1473	1498
2350	1020	1045	1070	1095	1120	1145	1170	1195	1220	1245	1270	1295	1320	1345	1370	1395	1420	1445	1470	1495	1520
2400	1042	1067	1092	1117	1142	1167	1192	1217	1242	1267	1292	1317	1342	1367	1392	1417	1442	1467	1492	1517	1542
2450	1063	1088	1113	1138	1163	1188	1213	1238	1263	1288	1313	1338	1363	1388	1413	1438	1463	1488	1513	1538	1563
2500	1085	1110	1135	1160	1185	1210	1235	1260	1285	1310	1335	1360	1385	1410	1435	1460	1485	1510	1535	1560	1585
2550	1107	1132	1157	1182	1207	1232	1257	1282	1307	1332	1357	1382	1407	1432	1457	1482	1507	1532	1557	1582	1607
2600	1128	1153	1178	1203	1228	1253	1278	1303	1328	1353	1378	1403	1428	1453	1478	1503	1528	1553	1578	1603	1628
2650	1150	1175	1200	1225	1250	1275	1300	1325	1350	1375	1400	1425	1450	1475	1500	1525	1550	1575	1600	1625	1650
2700	1172	1197	1222	1247	1272	1297	1322	1347	1372	1397	1422	1447	1472	1497	1522	1547	1572	1597	1622	1647	1672
2750	1194	1219	1244	1269	1294	1319	1344	1369	1394	1419	1444	1469	1494	1519	1544	1569	1594	1619	1644	1669	1694
2800	1215	1240	1265	1290	1315	1340	1365	1390	1415	1440	1465	1490	1515	1540	1565	1590	1615	1640	1665	1690	1715
2850	1237	1262	1287	1312	1337	1362	1387	1412	1437	1462	1487	1512	1537	1562	1587	1612	1637	1662	1687	1712	1737
2900	1259	1284	1309	1334	1359	1384	1409	1434	1459	1484	1509	1534	1559	1584	1609	1634	1659	1684	1709	1734	1759
2950	1280	1305	1330	1355	1380	1405	1430	1455	1480	1505	1530	1555	1580	1605	1630	1655	1680	1705	1730	1755	1780
3000	1302	1327	1352	1377	1402	1427	1452	1477	1502	1527	1552	1577	1602	1627	1652	1677	1702	1727	1752	1777	1802
3050	1324	1349	1374	1399	1424	1449	1474	1499	1524	1549	1574	1599	1624	1649	1674	1699	1724	1749	1774	1799	1824
3100	1345	1370	1395	1420	1445	1470	1495	1520	1545	1570	1595	1620	1645	1670	1695	1720	1745	1770	1795	1820	1845
3150	1367	1392	1417	1442	1467	1492	1517	1542	1567	1592	1617	1642	1667	1692	1717	1742	1767	1792	1817	1842	1867
3200	1389	1414	1439	1464	1489	1514	1539	1564	1589	1614	1639	1664	1689	1714	1739	1764	1789	1814	1839	1864	1889
3250	1410	1435	1460	1485	1510	1535	1560	1585	1610	1635	1660	1685	1710	1735	1760	1785	1810	1835	1860	1885	1910
3300	1432	1457	1482	1507	1532	1557	1582	1607	1632	1657	1682	1707	1732	1757	1782	1807	1832	1857	1882	1907	1932
3350	1454	1479	1504	1529	1554	1579	1604	1629	1654	1679	1704	1729	1754	1779	1804	1829	1854	1879	1904	1929	1954
3400	1476	1501	1526	1551	1576	1601	1626	1651	1676	1701	1726	1751	1776	1801	1826	1851	1876	1901	1926	1951	1976
3450	1497	1522	1547	1572	1597	1622	1647	1672	1697	1722	1747	1772	1797	1822	1847	1872	1897	1922	1947	1972	1997
3500	1519	1544	1569	1594	1619	1644	1669	1694	1719	1744	1769	1794	1819	1844	1869	1894	1919	1944	1969	1994	2019

There's no chance or guess-work about Larkin Float Shoes. Their dependability has been proven, by hundreds of leading operators, in every field. And whatever your own particular preference or requirement, there's a Larkin Float Shoe, Guide Shoe or Float Collar to EXACTLY satisfy that requirement.

You'll get perfect satisfaction from the new Larkin Ball-and-Seat Type Valve, just as you already have from the famous Larkin Poppet-Type Valve.

Possibly the Larkin Float Shoe shown here—Figure 427—is designed particularly for YOU. It has a shock-resistant, genuine Fabric Bakelite Guide, with the Bakelite Valve efficiently supported by concrete. Because of the large opening all the way through, double that of similar equipment, it is possible to pump the cement plug down with less pressure than with any other make.

And the strong, tough, shock-proof Bakelite Guide will be there to the bottom, solid and intact—yet easily pulverized when you start to drill!

Whatever YOUR requirements or preferences, if you want the very best in Floating Equipment, specify "LARKIN."

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Fig. 427

LARKIN PACKER CO.

FLANGE BOLT AND GASKET SIZES

Series 40 or 400

Nominal pipe size, in.	O.D. of pipe, in.	O.D. of flange, in.	Thickness of flange, in.	Diameter of bolt circle, in.	Number of bolts	Size of bolts			Size of flat gasket, I.D. & O.D., in.
						Diameter, in.	Machine bolt length, in.	2-nut stud length, in.	
1	1.315								
1¼	1.660								
1½	1.900	For sizes 3½ in. and smaller Series 60 or 600 flanges should be used							
2	2.375								
2½	2.875								
3	3.500								
3½	4.000								
4	4.500	10	1⅜	7⅞	8	⅞	Machine bolts are not recommended for Series 40 or 400 flanges	5½	4 x 7
6	6.625	12½	1⅝	10⅝	12	⅞		6	6 x 9¾
8	8.625	15	1⅞	13	12	1		6¾	8 x12
10	10.750	17½	2⅛	15¼	16	1⅛		7½	10 x14⅛
12	12.750	20½	2¼	17¾	16	1¼		8	12 x16½
14	14.000	23	2⅜	20¼	20	1¼		8¼	13⅛x19
16	16.000	25½	2½	22½	20	1⅜		8¾	15 x21⅛
18	18.000	28	2⅝	24¾	24	1⅜		9	17 x23⅜
20	20.000	30½	2¾	27	24	1½		9¾**	18⅞x25½
24	24.000	36	3	32	24	1¾		10¾**	22⅝x30¼

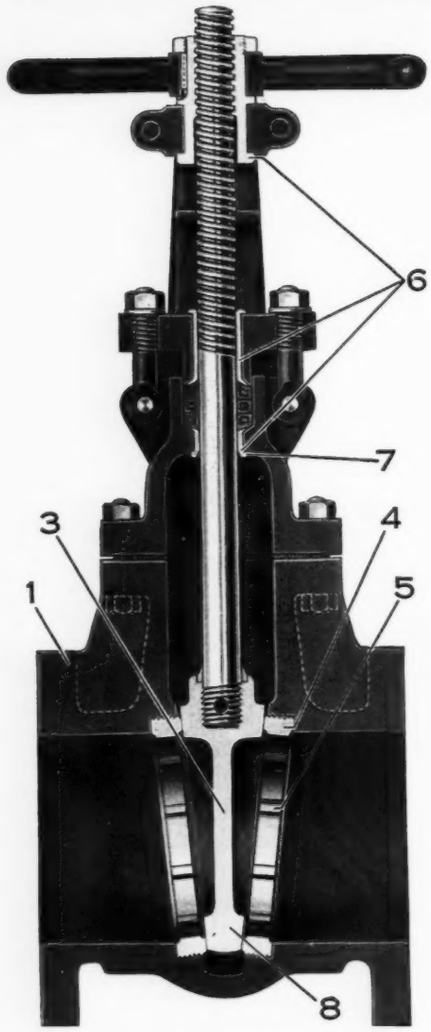
The above dimensions agree with the 400-lb. American Steel Flange Standard.
Lengths of studs apply for male to male ¼-in. raised faces.
**These studs may be ¼ in. shorter according to certain manufacturers' specifications.

Series 60 or 600

Nominal pipe size, in.	O.D. of pipe, in.	O.D. of flange, in.	Thickness of flange, in.	Diameter of bolt circle, in.	Number of bolts	Size of bolts			Size of flat gasket, I.D. & O.D., in.
						Diameter, in.	Machine bolt length, in.	2-nut stud length, in.	
1	1.315	4⅞	11/16	3½	4	⅝	Machine bolts are not recommended for Series 60 or 600 flanges	3½	1 x 2⅞
1¼	1.660	5¼	13/16	3⅞	4	⅝		4**	1¼x 3¼
1½	1.900	6⅛	⅞	4½	4	¾		4¼*	1½x 3¾
2	2.375	6½	1	5	8	⅝		4¼*	2 x 4⅜
2½	2.875	7½	1⅛	5⅞	8	¾		4¾*	2½x 5⅛
3	3.500	8¼	1¼	6⅝	8	¾		5	3 x 5⅞
3½	4.000	9	1⅜	7¼	8	⅞		5½	3½x 6⅜
4	4.500	10¾	1½	8½	8	⅞		5¾	4 x 7⅝
6	6.625	14	1⅞	11½	12	1		6¾	6 x10½
8	8.625	16½	2 3/16	13¾	12	1⅛		7¾	7⅛x12⅝
10	10.750	20	2½	17	16	1¼		8½	9¾x15¾
12	12.750	22	2⅝	19¼	20	1¼		8¾	11¾x18
14	14.000	23¾	2¾	20¾	20	1⅜		9¼	12⅞x19⅜
16	16.000	27	3	23¾	20	1½		10	14¾x22¼
18	18.000	29¼	3¼	25¾	20	1⅝		11**	16½x24⅛
20	20.000	32	3½	28½	24	1⅝		11½	18¼x26⅞
24	24.000	37	4	33	24	1⅞		13	22 x31⅛

The above dimensions agree with the 600-lb. American Steel Flange Standard.
Lengths of studs apply for male to male ¼-in. raised faces.
*These studs may be ⅛ in. shorter according to certain manufacturers' specifications.
**These studs may be ¼ in. shorter according to certain manufacturers' specifications.

When You Specify Iron Body Gate Valves Use this Check List



Iron Body Bronze Mounted

Standard { 125 lb. S.P. / 175 lb. W.O.G.

Heavy { 175 lb. S.P. / 350 lb. W.O.G.

Extra Heavy { 250 lb. S.P. / 500 lb. W.O.G.

Also regularly available in All-Iron patterns with renewable seat rings, for handling solutions which attack bronze but not iron.

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1. *Sound tough castings* that will safely withstand operating pressures and temperatures.	✓
2. *Uniform interchangeability of parts*, so that any replacement or repair part will be exactly the same size as that which is to be renewed.	✓
3. *Solid Disc* (not cored) that will not distort under temperature variations and pressure of the fluid handled.	✓
4. *Heavy renewable bronze seat rings* with special machine finish, and strong deep-cut threads that can be screwed tightly into the body without risk of springing the rings.	✓
5. *An ample number of substantial lugs* on seat rings to facilitate renewal.	✓
6. *Bronze bushings* between the bronze stem and iron parts of valve, to prevent corrodible contact and consequent scoring of stem and packing, which causes leaky stuffing boxes.	✓
7. *Back-seat bushing* in bonnet to provide a tight seat for repacking valve in wide open position.	✓
8. *Disc perfectly guided* so that it rides straight and true to its seat without touching seat rings until near the point of closure. To ensure this perfect guiding, the *guide ribs in the body* as well as the guide channels in the disc must be accurately machined.	✓

The sure way for you to obtain *all* these service-giving and money saving features is to specify Lunkenheimer Iron Body Gate Valves. Through their use you will effect substantial reductions in maintenance expense and valve costs.

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BOILER MOUNTINGS — LUNKENHEIMER VALVES — LUBRICATING DEVICES

Comparative Efficiency of Catalysts in Polymerizing Unsaturated Hydrocarbon Gases Under Pressure

Gas rich in ethylene and propylene polymerized to gasoline of good quality

By

D. RUDKOVSKII, G. SHEVTSOVA, and G. PEMELLER*

SINCE Ipatieff and Nemtsov[1†] studied the homogeneous polymerization of olefins and found that this reaction can be accelerated by floridin a number of workers have reported the results of research on this subject.

Reference is made to published research mentioned in the list of references at the end of this translation under numbers 2, 3, 4, 5, and 6. The laboratory-scale experiments for testing various catalysts were continuous in a vertical autoclave of 1140-cc. capacity. The gases to be polymerized were supplied in the liquid phase to the top of the autoclave from a tank fitted with a tube reaching to the bottom and under a pressure of 35 to 45 atmospheres. (Fig. 1.) The contact period was calculated according to the formula:

$$T = \frac{(V - v)P \times 3600}{a(1 + \alpha t)}$$

in which a is volume velocity of gas in liters per hour; V is capacity of the autoclave in liters; v is the volume occupied by the catalyst in liters; P is pressure in atmospheres; and t is the temperature in the reaction zone.

The propylene fraction of technical cracked gas was used as raw material for the experiment. The approximate percentage composition of this material was as follows:

iso-butylene	3-8
n-butylene	3-8
propylene	30-35
ethylene	20-25
amylene	0-2
saturated hydrocarbons	35-40

A preliminary experiment on polymerization of pure propylene in an autoclave was performed without any catalyst. The purpose of this experiment was to establish the impossibility of sufficient polymerization of propylene, i.e. the basic component of the unsaturated portion of the gas, using temperatures between 300° and 400° without catalysts. At 350° and 30 atmospheres during a contact period of 9.5 minutes no liquid products of polymerization of propylene were obtained, and in general only very slight changes were observed.

In further experiments, the following catalysts were tested:

1—clay used for dehydration of alcohols

2—zinc chloride on chamotte (grog)

3—chamotte treated with hydrochloric acid

4—molten technical zinc chloride

5—zinc shavings

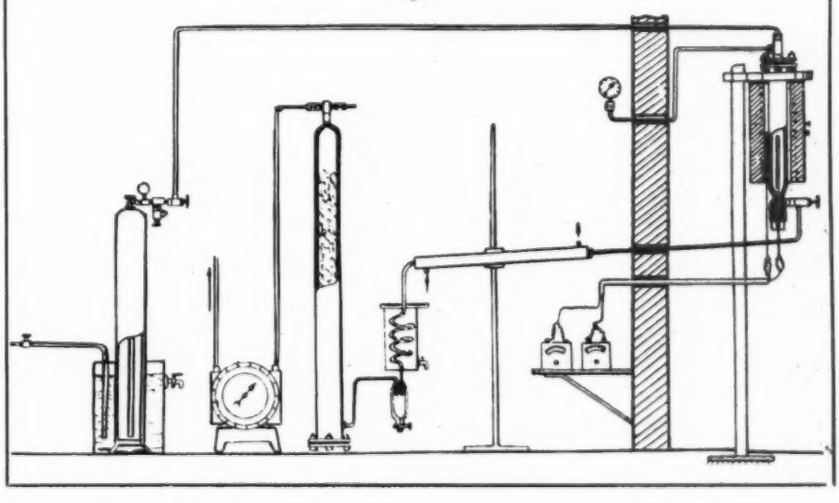
6—phosphoric acid on chamotte

Table 1 gives the results of the experiments with these catalysts. Analyses of liquid products are given in Table 2. The catalysts were prepared in the following manner:

1. Clay for dehydration of alcohol was treated with steam at 350° and dried at the same temperature. After the first experiment it was not regenerated.

2. Zinc chloride on chamotte. About 670 grams or 380 cc. of ground chamotte was dried at 150° to constant weight and then placed for 24 hours in a saturated solution of zinc chloride. This solution was made by dissolving metallic zinc in concentrated hydrochloric acid till evolution of hydrogen ceased and then removing the excess metal by filtration. After the chamotte was impregnated in the solution of zinc chloride, the excess solution was decanted, and the catalyst dried to constant weight at 160° to 175° in a thermostatically controlled oven. About 60 grams of zinc chloride

Fig. 1



*PROMYSHLENNOST' ORGANICHESKOI KHIMII. *Organic Chemical Industry.* Vol. III, No. 6, March, 1937, pp. 332-335. Translated by Foreign Literature Service, Process Management Company.

This is a literal translation except for sections of apparently minor importance, which are summarized. This translation has been submitted by the Petroleum Division of the American Chemical Society. The Petroleum Division, however, assumes no responsibility for the facts and opinions presented in this paper, nor does it necessarily endorse statements made therein.

†Numbers refer to titles listed at the end of the article.

TABLE 1

Catalyst	Temperature, °C.	Pressure, atm.	Contact period, min.	Total duration of the experiment, hr.	Formation velocity of gasoline, grams per hr.			Yield of liquid products, percent by weight	Conversion of the unsaturated part of the gas, percent by weight		Coke and tar on the catalyst, percent of the gas used
					Initial	Average	Final		Initial	Final	
1. Clay for dehydration of alcohols	300	50	9.5	24.0	19.9	15.6	11.6	11.5	18.8	12.7	1.5
1a. Clay used in experiment 1	400	50	8.0	15.0	21.0	18.3	15.8	12.4	19.1	15.9	2.2
2. $ZnCl_2$ on chamotte	300	50	11.5	48.0	42.7	27.5	8.5	18.6	46.3	9.0	0.7
3. Same as above	300	50	12.5	33.0	37.0	26.4	9.1	18.5	....	8.8	0.66
12. Pure chamotte	400	50	10.2	19.0	....	21.8	....	14.9	14.3	21.6	Traces
4. Chamotte treated with 10 percent HCl	300	50	12.0	8.0	....	1.5	....	1.0	1.5	1.5	None
4a. Same as above	400	50	10.5	20.0	41.0	23.5	14.1	14.8	40.2	13.9	Traces
5. $ZnCl_2$ on chamotte	400	50	9.0	22.0	108.5	51.0	23.7	29.0	40.0	27.3	1.6
6. Same as above	400	50	3.5	4.0	125.6	125.0	113.0	28.8	41.1	36.8	1.5
7. Molten technical $ZnCl_2$	350	35*	6.0	2.5	....	30.0	....	30.0	43.0		Not calculated
7a. Same as above	350	50	8.5	24.0	46.0	29.5	20.0	17.3	29.7	20.4	0.8
9. Zn shavings	350	50	15.0	7.5	....	14.4	....	9.6	15.3	15.3	None
10. Phosphoric acid on chamotte	250	25	4.5	30.5	....	48.2	....	24.0	35.0		0.4
10a. Same as above	250	25	7.5	67.5	....	40.3	....	35.2	36.8	34.2	0.5

*At a pressure of 10 atm. the yield of liquid products is negligible.

TABLE 2
DISTILLATION AND SPECIFIC GRAVITIES OF THE FRACTIONS

Experiment no.	d_{20}^{20} of the raw product	To 200°		200 to 250°		Residue	
		Percent by wt.	d_{20}^{20}	Percent by wt.	d_{20}^{20}	Percent by wt.	d_{20}^{20}
1	0.7603	72.4	0.7400	16.6	.....	11.0	.....
1a	0.7830	75.0	0.7430	9.0	.....	16.0	.....
2	0.7742	68.0	0.7439	15.3	.....	16.7	.....
3	0.7711	71.2	0.7428	19.3	.....	9.3	.....
4*		54.5		12.4		32.8	
5	0.7607	74.4	0.7340	11.9	0.8604	13.1	0.9366
6	0.7712	72.7	0.7348	12.8	0.8548	12.9	0.9143
7	0.7649	77.5	.....	10.8	.....	11.7	.....
7a	0.7500	76.1					
9	0.7782	89.8	0.7671	3.8	0.8834	4.9	0.9336
10	0.7605	78.2	0.7401	12.2	0.8406	8.6	
10a	0.7704	72.5	0.7431	16.9	0.8307	10.2	0.9415
12	0.8095	72.8	0.7865	12.7	0.8699	13.7	0.9224

*The gasoline contained 11 percent dissolved gas.

was precipitated upon the chamotte in this way.

3. Chamotte treated with hydrochloric acid. Dried chamotte was kept for 24 hours in a 10 percent solution of hydrochloric acid and the treatment finished in the manner just described. The amount of chamotte used was the same.

4. Molten technical zinc chloride. Sheet zinc was dissolved in hydrochloric acid until no more hydrogen was evolved. The solution of zinc chloride was then filtered, evaporated, and further heated to melting, hydrogen chloride being added from time to time. The catalyst was charged into the autoclave and melted. The melting point of zinc chloride is betwen 250° and 300°. The charge amounted to about 400 cc., which weighed 1190 grams.

5. Metallic zinc shavings. Sheet zinc used in the previous experiments was cut into small strips, washed with light gasoline, cleaned to a shiny surface, a file and sandpaper being used for the purpose, and 1139 grams amounting to 161 cc. were charged.

6. Phosphoric acid on chamotte. Phosphoric acid of specific gravity 1.6 (75 percent) was heated at 180° for two hours. The acid, the specific gravity of which amounted now to 1.84, was poured upon chamotte previously dried to constant weight and left for 18 hours. The excess acid was then decanted and the chamotte dried in porcelain dishes for three hours at 250°. The total volume of the charge of this catalyst amounted to 460 cc. The chamotte weighed 768 grams and the mixture of phosphoric acids 188 grams.

It is seen from Table 1 that experiment No. 1 and 1-a, in which clay for dehydration of alcohols was used, resulted in an insignificant increase in yield of liquid products at the beginning of the experiment in comparison with that in which no catalyst was used. The yield of the product declined rapidly because of the poisoning of the catalyst when its surface became covered with coke. The analysis of the gases indicates that the polymerization took place at this state mainly at the expense of ethylene.

Experiments 2, 3, 5, and 6, in which zinc chloride on chamotte was used (particle size about 7 by 7 by 7 mm.) revealed great activity of the catalyst, which is, however, rapidly reduced by precipitation of coke on the surface of the catalyst. Gas analysis shows that large initial yields are to be explained by the high degree of polymerization of propylene. When it was attempted to reduce the coke formation by reducing the temperature to 200°, the yield of the product fell to an insignificant quantity.

Experiments No. 4 and 4-a with chamotte treated with hydrochloric acid, as well as the experiment with chamotte subjected to no treatment except drying, show that zinc chloride (or the basic salt always contained in it) and not the chamotte carrier is the highly active catalyst, which is quickly poisoned. The polymerization proceeds mainly at the expense of ethylene. No coking was observed.

Experiments No. 7 and 7-a demonstrate the high activity of zinc chloride in its molten phase although its contact surface was small. A comparatively rapid poisoning of the catalyst is observed, owing to high molecular products of polymerization dissolving in it. In addition, use of molten zinc chloride necessitated the removal of the reaction products from the upper part of the autoclave, and because of this the heavy part of the liquid products formed remained in the autoclave as impurities of the zinc chloride. The difficulty of distilling the heavier part was also increased by the fact that elevated pressure was used.

Experiment No. 9 with zinc shavings gave the same yield as the experiment without any catalyst. Polymerization proceeded at the expense of ethylene. No coking was observed. The metal surface became only slightly dull. The product was light, and 90 percent of it boiled at a temperature below 200°. (Table 2.)

(Continued on Page 68)

CORE ORIENTATION

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Sperry-Sun Core Orientation Service does not interfere with the progress of drilling. The orientation is determined in our laboratory to which the selected cores, taken by any type of core barrels in the ordinary course of drilling, and properly marked, are shipped from any distances. No special equipment is required at the well. There is no loss of drilling time.

U. S. PAT. 1,792,639; 1,778,981; 2,089,216; 2,104,752; 2,105,650; 2,149,715; 2,149,716; 2,149,717 and others pending.

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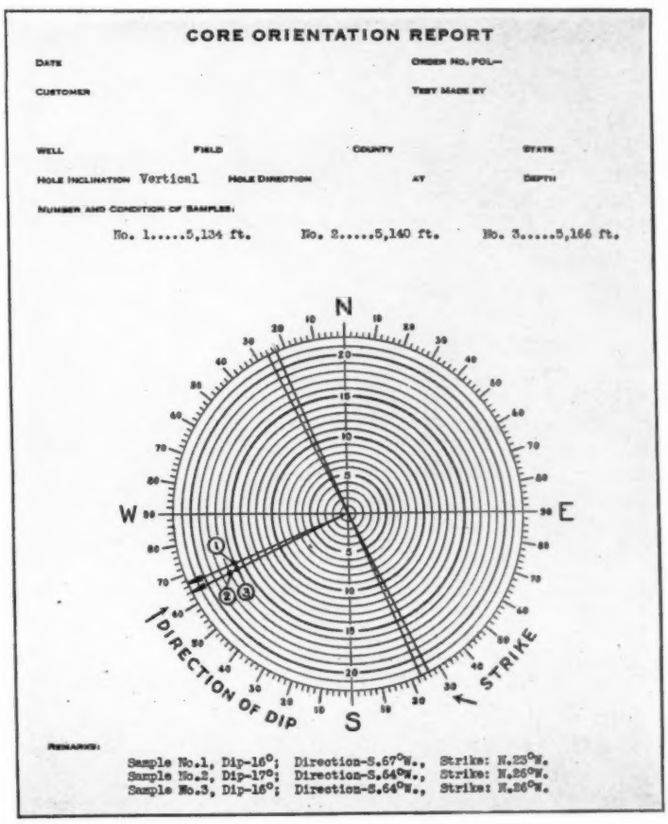

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WELL — FIELD — COUNTY — STATE

HOLE INCLINATION Vertical — HOLE DIRECTION — AT — DEPTH

NUMBER AND CONDITION OF SAMPLES:

No. 1.....5,134 ft. No. 2.....5,140 ft. No. 3.....5,166 ft.

N E S W

DIRECTION OF DIP

STRIKE

REMARKS:

Sample No.1, Dip-16°; Direction-S.67°W., Strike: N.23°W.
Sample No.2, Dip-17°; Direction-S.64°W., Strike: N.26°W.
Sample No.3, Dip-16°; Direction-S.64°W., Strike: N.26°W.

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(Continued from Page 66)

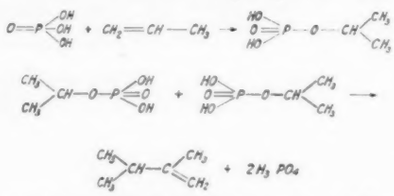
Experiments 10 and 10-a, in which a mixture of phosphoric acids on chamotte was used gave the best results with respect to the yield of liquid polymers, as well as with respect to stability to poisoning; the temperature (250°) and pressure (25 atm.) could be markedly lowered in comparison with the experiments in which other catalysts were used. Ethylene was only slightly affected, propylene reacted to the extent of 40 to 50 percent, and butylenes were almost completely polymerized. The gasoline obtained was more stable than that prepared with the aid of other catalysts. The surface of the catalyst at the end of the experiment was covered with a thin layer of greenish-brown tar possessing a specific odor of esters. The extent of polymerization was also greatest in this experiment.

A further study was undertaken of the effect of the quantity of acid precipitated on the chamotte, of the temperature, of the pressure, of the contact period, and also the composition of the unsaturated portion of the gas. The composition of the carrier when dried to constant weight at 250° was as follows:

Constituent	*Percent*
silica	56.31
alumina	33.06
iron oxide	6.15
calcium oxide	1.75
magnesium oxide	0.67

The acid was put on the chamotte in the same way as before. Because ortho-phosphoric acid is transformed for the most part into pyro-phosphoric acid on heating to 250°, and into meta-phosphoric acid on heating to 350° and higher[7], several experiments were performed in which the temperature to which the catalyst was heated varied in such a way that one of these acids predominated. The results are summarized in Table 3. The fact that in experiment No. 24 some water was eliminated from the catalysts indicated that in the further course of the experiment at the temperature of 250°, a mixture of ortho- and pyro-phosphoric acids was present on the chamotte. Nevertheless, a comparison of experiments 24 and 10-a shows that the pyro-acid has a greater effect than the ortho-acid. Experiment 21 shows that heating of the ortho-acid on chamotte at higher temperatures (in this case 600°) has a negative effect. In all other experiments the catalyst was heated at a constant temperature of 250°. The catalytic action of phosphoric acids in polymerization of olefins is based on the ability of the olefins to form esters with them.

The above statement is supported by references to a number of writers [8, 9, 10]. Ipatieff's explanation of the mechanism of the action of the catalyst[11] consists in the assumption that intermediate esters of phosphoric acid



are formed and soon decompose, resulting in regeneration of the acid and growth of the size of the olefin molecule.

The intermediate products were investigated by the present writers[12].

Table 4 gives the results of the experiments in which the amount of acid on the chamotte was varied. An experiment with pure chamotte dried to constant weight is also reported for the sake of comparison. It is seen from this table that increase of the amount of acid increases the percentage of conversion of the unsaturated portion of the gas. This is clearly seen when the experiments in which 100 grams and those in which 200 grams of acid were used are compared. As phosphoric acid decomposes porcelain and ceramic products[13], the conclusion is justified that when less than 180 grams of acid is used nearly the entire amount is transformed, on heating with chamotte, into the corresponding phosphates, and in the absence of free hydroxyl groups there is virtually no polymerization reaction. Consequently, the amount of active acid is 20 to 30 grams of free acid, a conclusion confirmed by the results of experiments with other carriers.

The summary indicates that phosphoric acid on a solid carrier has the strongest catalytic effect of those substances studied in the present investigation and that its catalytic properties largely depend upon the method of preparation, temperature, properties of the carrier, and the amount of acid used.

TABLE 3

Experiment no.	Temperature of heating the catalyst, °C.	Amount of acid used, grams	Velocity of gasoline formation, grams per hr.	Yield on the unsaturated part of the gas, percent by weight	Yield on the total gas used, percent by weight
24	140–150	151	17.9	22.3	17.0
10a	250	188	40.3	42.0	35.2
21	600	30	5.2	10.5	6.9

Temperature of the experiment, 250°; pressure, 25 atm.; contact period, 6 to 7 min.; composition of the gas: iso-C_4H_8, 10.4%; C_3H_6 plus n-C_4H_8, 50.6%; C_2H_4, 14%.

TABLE 4

Experiment no.	Weight of acid, grams.	Composition of the gas by sulphuric acid analysis (percent by vol.)			Yield of liquid products (percent by wt.)		Gasoline formation velocity, grams per hr.
		iso-C_4H_8	n-C_4H_8	C_2H_4	On total gas	On the unsaturated part	
11	0	10.0	51.0	15.0	2.1	2.5	1.8
13	104	10.6	50.9	14.5	10.1	14.0	20.6
16	102	....	....	....	10.6	13.2	19.0
26	207	11.2	47.0	18.0	42.5	52.7	63.6

Temperature of the experiment, 250°; pressure, 25 atm., catalyst heated at 250°; contact period, 5 to 7 minutes.

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[8]Mueller, *Ber.* **58**, 2105, 1925.

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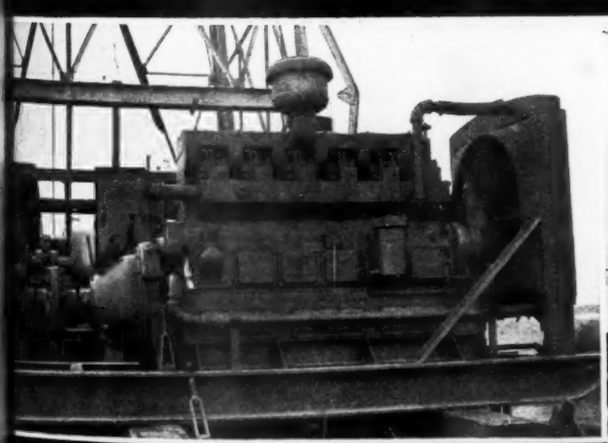

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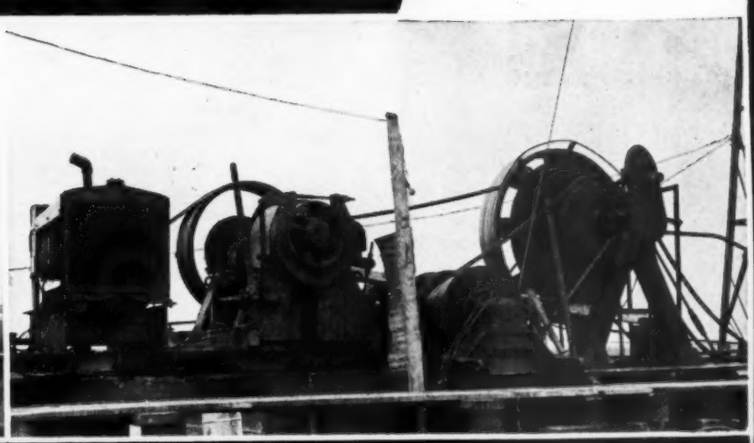

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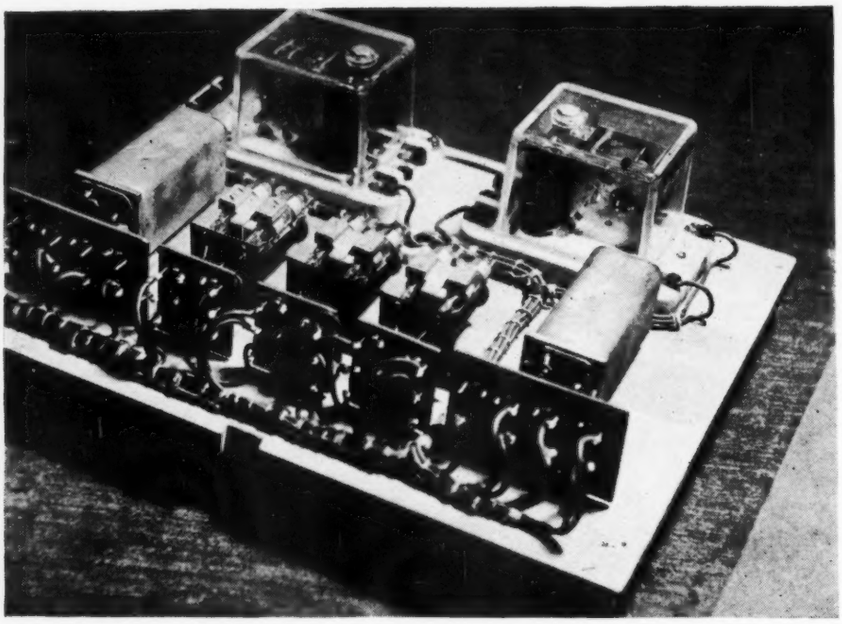

P 625.

Foreground—Connection strips

Center—Vacuum contact switches between repeating coils

Background—Selectors and glass covers

A PETROLEUM ENGINEER FEATURE

Vacuum-contact relay overcomes complications arising from point corrosion, resistance, and unreliable operation of contacts used in series

Remote-Control Test Station on Pipe-Line Communication System

By J. F. COLLERAIN

Superintendent Telephone and Telegraph, Houston Pipe Line Company

APPLICATION of available equipment to new uses may give surprising results, and especially is this true in the communication field, where equipment designed for one task is soon put to many uses.

A remote control test station as herein discussed is by no means a new method of control, but rather a modern way of doing what could have been accomplished before had it not been for such difficulties as point corrosion, resistance, and unreliable operation of contacts used in series in a telephone or telegraph circuit. These complications are overcome by the use of a vacuum-contact relay, which consists of a relay equipped with two glass-cylinder vacuum contacts. The armature of the relay has two levers that move a glass rod, projecting from the corresponding vacuum cylinders, and this moves the single contact contained within. The contacts can be obtained as a make or a break, depending upon its application in the circuit. The two incoming wires for insertion of the contacts in a circuit are sealed at their entrance to the cylinder. The relay is operated on 6 volts d.c. but can be adapted to other voltages by changing the characteristics of the relay coil. The capacity of the contact is 6 amp. at 220 volts and the resistance is 0.013 ohm. The manufacturer states, however, that an allowance for natural variation should not exceed plus or minus 20 percent, owing principally to the pressure of the contacts. The minimum life of these contacts, as tested at 35 pulses per second, is 1,300,000 operations. It is interesting to note that the glass rod is fused to the main cylinder at a recessed point, the cylinder having a false bottom. Operating time of the relay is 0.010 to 0.040 seconds and the release time is 0.005 to 0.025 seconds.

The circuit is operated by the wire chief, and selectors are worked in the usual manner by sending the necessary combination of impulses on the telegraph circuit to cause the selectors to close their local circuit. Here again the apparatus is modernized a bit by substitution of a regular telephone dial for the selector calling keys; any combination using the numbers 1 to 5 can be made with one dial. In the circuit illustrated two selectors are used because South line happened to branch at this particular location where the East-

J. F. COLLERAIN

entered the oil business in 1925 with the research and geophysical department of the Humble Oil and Refining Company—Joined the engineering department of the Houston Pipe Line Company in 1927 and was made superintendent of telephone and telegraph in 1934—He is a member and director of the Petroleum Industry Electrical Association and an associate member of the Association of American Railroads, Telephone and Telegraph Section.

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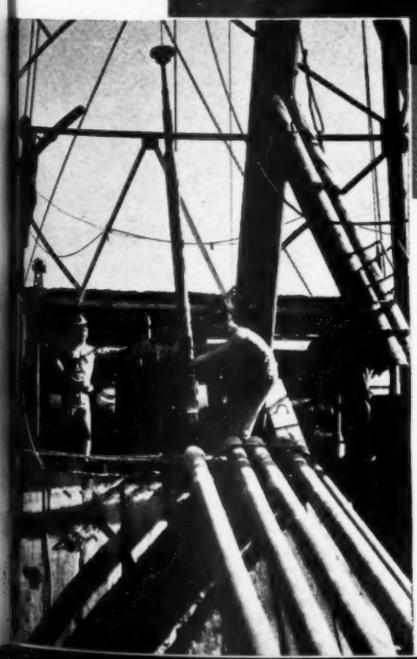

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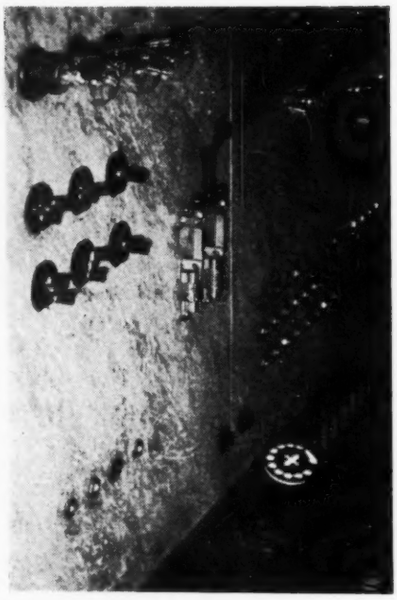
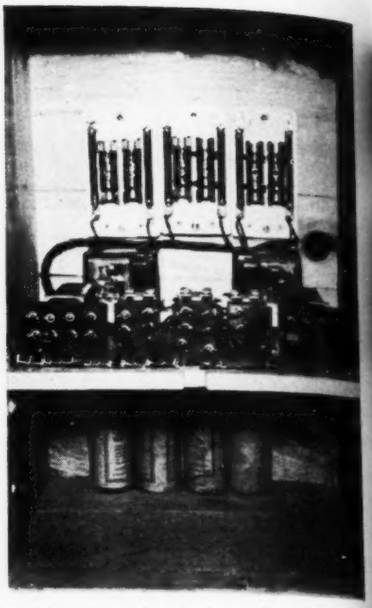
West line is tested, and although the selector and local circuit of South line do not in any way function when East-West line equipment is operated, nevertheless the multiplicity of operation that can be arranged is obvious. The repeating coil in South line is used to block-off the telegraph battery from this line.

Considering only East-West line, when the selector is operated and its local circuit is closed, the battery is impressed on relay D, normally open, causing this relay to operate and close vacuum-contact switches that ground the telegraph battery and also impress the local battery on relay E. When relay E is energized it operates vacuum-contact switches that open East-West line. The line will now remain open until the selector combination is cleared by the wire chief. The use of relay D and its vacuum switches completes the telegraph circuit before East-West line is opened, as otherwise the selector would clear itself and release its local circuit immediately .

The equipment is housed in a pole box 14 in. by 18 in. by 28 in., and is protected by fusible Argon-Neon lightning arresters.



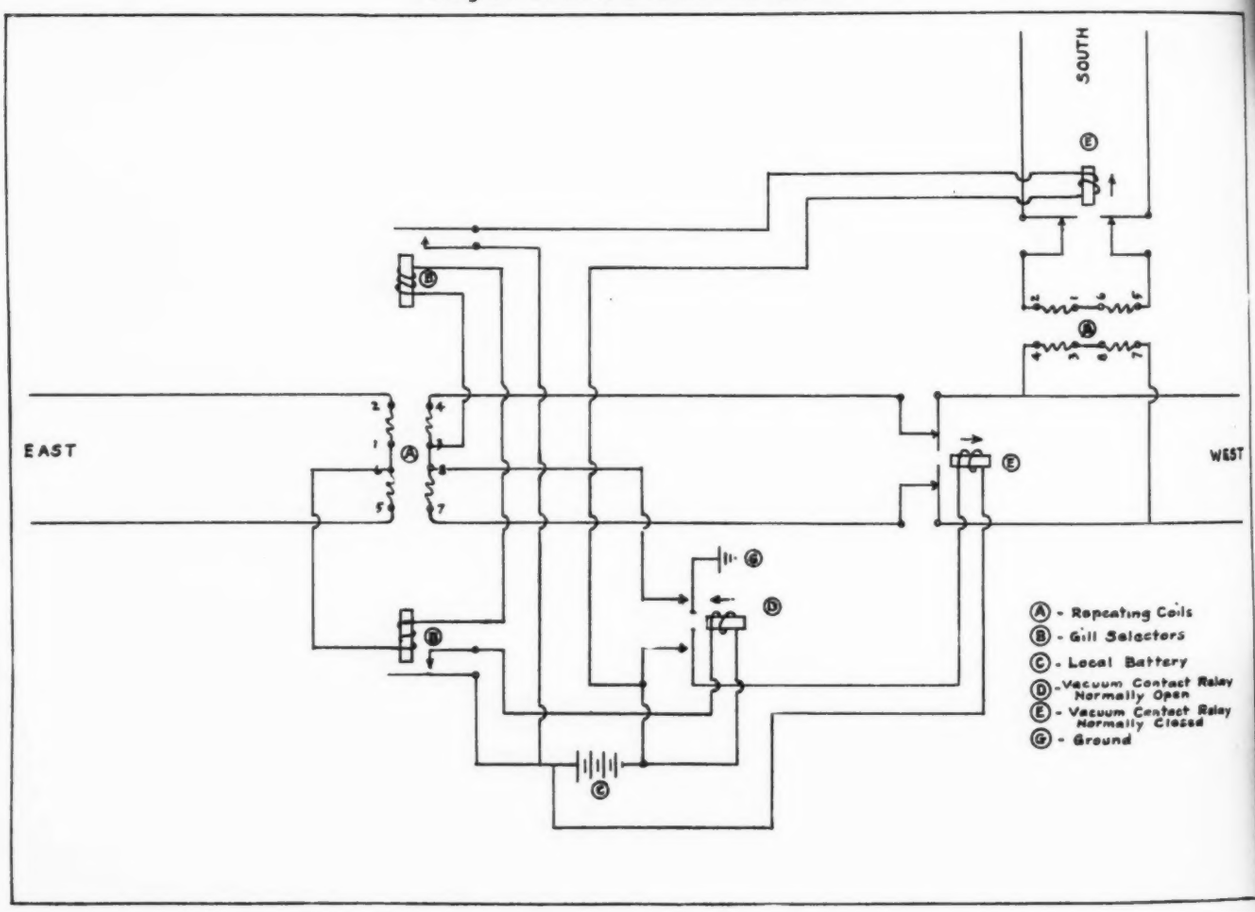
View of test board in general office, showing selector call keys and telephone dial



Inside view of pole box, showing lightning arresters, relays, repeating coils, selectors, and dry cell battery

The vacuum-contact relays in this circuit are the same type that many geophysical crews are now using because of their resistance to corrosion.

Diagram of remote-control test station



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Exploiting Stray Sands in Stripper Fields

Zones originally cased-off prove to be valuable source of production

By

By F. R. COZZENS

Equity Oil and Gas Company

MANY major oil sands are overlaid at various depths by other formations that contain appreciable quantities of crude oil and gas. Back in the boom days these stray sands were regarded as unimportant because they seldom showed oil or gas on penetration, so after brief measurements the drill was sent down through them to better-known reservoirs below. Not until years of continuous pumping had exhausted the lower rock did operators realize that valuable sources of income had been cased-off. The experimental work in reclaiming stray sands that then began has finally reached a stage where it is possible in many districts to use the present pumping equipment to produce oil from higher strata in the well. In many wells the production from the stray sand has equaled or exceeded the former output from recognized strata at greater depth.

In reclaiming a stray sand, pumping equipment is pulled from the well and the hole is plugged with cement to a point about 10 ft. below the bottom of the sand to be treated. A charge consisting of 300 to 500 lb. of gelatin, 90 percent strength, or its equivalent in nitroglycerin, is next anchored in the sand and exploded. As soon as the spoil has been thrown-out, and before caving starts, a pipe line is placed over the hole, and the reservoir made by the blast is completely filled with crude oil. Casing is then seated and the well is capped and allowed to remain dormant for 30 to 60 days.

When operations are resumed, the crew is likely to find that natural gas pressure has developed, owing to the fact that the oil placed in the reservoir has softened the sludge and penetrated the rock for a considerable distance. This softening process is very important because the sand, having been opened and cased-off, has been subjected over a period of several years to air, mineral oxides, and surface water that has seeped downward behind the casing. The sand face in all such wells is hardened, and the channels are invariably clogged with paraffin and sludge. When the reservoir is emptied, rock production naturally follows, and replaces the fluid pumped out. In this manner stray oil sands are being made to yield oil.

F. R. COZZENS

was born near Marietta, Ohio, October 10, 1895—Has served in the capacities of tool dresser, rig-man, foreman, scout, and lease hound—In 1929 he helped organize the now defunct Ohio-Pennsylvania Oil Company—Two years later he became connected with Lakeshore Oil and Gas Company, and when it merged in 1935 with the Equity Oil and Gas Company he was transferred to the latter as field man, the position he now holds—Has also performed some geological work in conjunction with the State Bureau of Mines.

If no log of the well has been kept, the procedure is more complicated. It is usually necessary to ream the hole to the top of the sand, then reduce its diameter to form a shoulder for setting the casing. Stray sands also have a reputation for irregularity. The sand may be present in some wells in a given territory but not in others. If an air compressor is available, the presence of the sand may be determined without re-drilling by plugging a test well as for shooting and then introducing air under a pressure of 300 to 500 lb., which pressure is maintained for several days. The appearance of air bubbles outside the casing of other wells in the immediate vicinity will indicate the presence of that sand in those wells.

Stray sands, of which more than 20 are recognized by operators in Ohio and West Virginia fields, range in thickness from 10 to 60 ft. The texture is usually porous, and in some areas these sands prove to be exceedingly productive. These sands have not been artificially stimulated by explosives, air, steam, or similar agencies to any great extent, so the production is virgin, and operators may continue to obtain revenue long after deeper reservoirs are exhausted.

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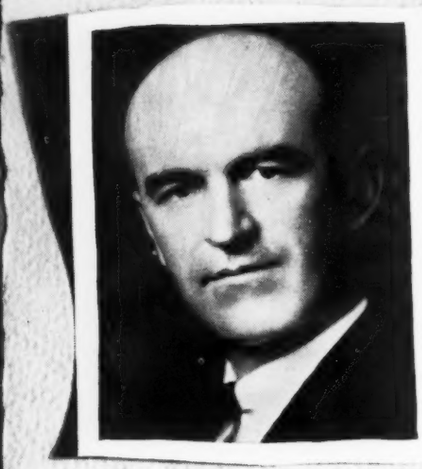

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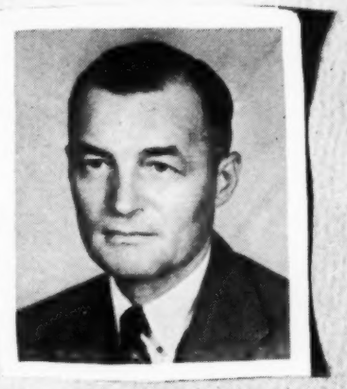

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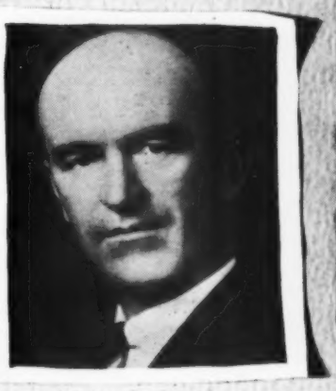

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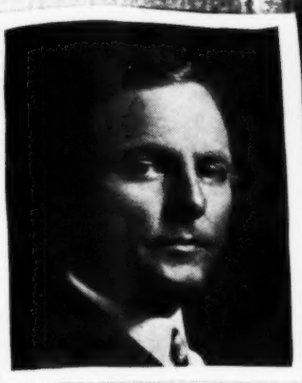

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Program for Oil-World Exposition

Houston, Texas • April 24-29, 1939

General Chairman Program Committee: Joe H. Russell, Assistant Vice-President Gulf Oil Corporation.

MONDAY, APRIL 24

Host for the Day: S. P. Brown, Vice-President Hughes Tool Company.

Directors for the Day: J. C. Axelson, Frank Champion, H. J. Craig, H. R. Cullen, M. N. Dannenbaum, T. J. Donoghue, J. M. Kinabrew, D. T. McIver, J. W. Newton, J. R. Parten, Tom Pew, W. W. Plowden, Sid Richardson, F. H. Thrailkill, W. C. Trout, and J. A. Vickers.

12:30 P.M.—Luncheon of Oil-World Exposition directors and officials, Houston Club Coliseum.

2:00 P.M.—*Official opening ceremonies.* Coliseum. Jesse H. Jones, chairman of the Reconstruction Finance Corporation; Oscar F. Holcombe, Mayor of Houston, and many prominent men in official life, oil company executives, executive heads of oil industry equipment companies, officers and directors of the Oil-World Exposition—all of whose names will be announced at the ceremonies—will participate.

Export Program

Oil Equipment export committee: O. D. Small, chairman, Portable Rig Company; D. H. Bellamore, Republic Steel Corporation; Chas. T. Campodonico, Argentine Government Oil Fields; J. W. Casterton, Standard Oil Company of New Jersey; J. A. de Lanoy, Asiatic Petroleum Corporation; A. A. Dill, Axelson Manufacturing Company; R. J. Eiche, export manager, Manhattan Beach, California; Clyde Ellwood, Fluid Packed Pump Company; W. G. Foster, Anglo American Purchasing Company; C. Clay Johnson, Shaffer Tool Works; W. J. Malloy, Oil Well Engineering Company; E. B. Middlekauf, The Texas Company; W. J. Nutto, Reed Roller Bit Company; J. S. Parks, Atlantic Refining Company; F. J. Petura, Henry L. Doherty and Company; T. L. Putnam, W-K-M Company; F. C. Ripley, Jr., Emsco Derrick and Equipment Company; D. A. Rosoff, Amtorg Trading Corporation; S. B. Schnitter, Baker Oil Tools, Inc.; W. H. Siems, Hughes Tool Company; A. V. Simonson, Buda Company; H. Slater, Venezuela Gulf Oil Corporation; I. I. Smolianoff, Amtorg Trading Corporation; J. R. Taylor, Socony-Vacuum Corporation; Thos. E. Ward, Oilfield Equipment Company, Inc.; J. A. Whiteley, Pan American Petroleum and Transport Company; Val. R. Wittich, Jr., export sales representative, New York, and Geo. W. Young, Standard-Vacuum Oil Company.

2:30 P.M.—Oil equipment export committee meeting, Convention Hall.
Papers to be presented:

"Crating and Papers Necessary for Foreign Shipments"

"Proper Insurance on Foreign Shipments"

"General Trend of Drilling Equipment in Foreign Fields"

"Export Sales from the West Coast"

"Transportation Problems in Venezuela"

"Transportation Problems in Colombia"

"Foreign Exchange"

"Barter and Its Effect on Foreign Trade"

"Methods of Promoting Foreign Sales"

"Aviation and Its Place in the Oil Industry"

"Petroleum Development in Brazil"

"Petroleum Outlook in Roumania"

"The Far East"

7:30 P.M.—Oil equipment export committee meeting, Convention Hall.

Entertainment Program, General

7:00 P.M.—Humble Glee Club, Balcony Coliseum.

1:00 P.M. to 6:00 P.M.—Skeet shooting, Robert J. Miller, supervising, Brae-Burn Skeet Club.

TUESDAY, APRIL 25

Host for the Day: F. S. Carothers, Houston Branch Manager Norvell-Wilder Supply Company.

Directors for the Day: Richard Bloss, A. I. Brainard, J. D. Brance, S. T. Childress, K. W. Davis, N. G. Guiberson, A. M. McCorkle, W. R. Martin, H. W. Millmine, M. E. Montrose, J. E. Moore, Fred F. Murray, G. L. Ratcliffe, Joe H. Russell, D. R. Snow, and E. R. Turner.

Refinery Program

Place: Room D, Balcony Coliseum

Refinery Program Committee: W. H. Curtin, chairman, W. H. Curtin and Company, and Ed G. Lenzner, vice-chairman, Oil-World Exposition. Chemist's Division Committee: K. H. Clough, sub-chairman, W. H. Curtin and Company; W. F. Fulton, United Gas Company; E. W. Gardner, The Texas Company; F. W. Jessen, Humble Oil and Refining Company; A. R. Rickards, Sinclair Refining Company, and J. H. Tabony, Crown Central Petroleum Company.

10:00 A.M.—"The Manufacture and Testing of Liquid-in-Glass Laboratory Thermometers," by R. M. Wilhelm, C. J. Tagliabue Manufacturing Company, Brooklyn, New York.
"Trends and Economics in Testing of Asphaltic Materials," by Daniel Smith, Texas State Highway Department, Austin, Texas.

1:30 P.M.—"Requirements Governing Accuracy and Stability in the Manufacture of Laboratory Glassware," by J. J. Moran, Kimble Glass Company, Vineland, New Jersey.
"Water Problems of the Oil Industry," by L. P. White, City of Houston Water Department.
"The Microscope and Its Application to the Petroleum Industry," by John T. Rooney, Spencer Lens Company, Buffalo, New York.
"Motor Car Fuel Specifications, Trends and Economics," by F. T. Mechlin, State of Louisiana, Baton Rouge, Louisiana.

7:30 P.M.—"Manufacture and Packaging of Analytical Chemicals," by G. B. Hafer, J. T. Baker Chemical Company, Phillipsburg, New Jersey.
"The Manufacture of Laboratory Glassware," Movie Film by Robert Fish, assistant sales manager, Laboratory Division, Corning Glass Works, Corning, New York.

Pipe Line Program

Place: Room C, Balcony Coliseum

Pipe Line Program Technical Committee: L. F. Scherer, chairman, The Texas Pipe Line Company; E. L. Adams, General Petroleum Corporation; Charles Bunje, Jr., Illinois Pipe Line Company; H. D. Carmouche, Houston Pipe Line Company; E. R. Cunningham, United Gas Pipe Line Company; W. R. Finney, Oklahoma Pipe Line Company; Chas. Fitzgerald, Sinclair Refining Company; A. L. Forbes, Jr., El Paso Natural Gas Company; C. F. Guinn, Tidal Pipe Line Company; W. G. Heltzel, Stanolind Pipe Line Company; R. B. High, Shell Pipe Line Corporation; A. H. Horne, Empire Pipe Line Company; C. C. Ingram, Shell Pipe Line Corporation; E. F. Kindsvater, Phillips Petroleum Company; E. A. Koenig, Magnolia Pipe Line Company; R. D. McClaran, Pure Transportation Company; Walter F. Rogers, Gulf Refining Company; H. M. Stevenson, Humble Pipe Line Company; J. C. Stirling, Stanolind Pipe Line Company; Lafe Todd, Union Oil Company of California, and F. E. Warterfield, Jr., Oklahoma Pipe Line Company.

9:30 A.M. to 9:40 A.M.—Opening Remarks: H. M. Stevenson, chairman, Humble Pipe Line Company.

9:40 A.M. to 10:00 A.M.—"Maintenance of Portable Pipe Line Field Pumping Units," N. G. Moore, Empire Pipe Line Company.

10:00 A.M. to 10:15 A.M.—Discussion.

10:15 A.M. to 10:45 A.M.—"A Method of Arresting Pressure Surges in Discharge Piping of Reciprocating Pumps," by J. B. Harshman, Stanolind Pipe Line Company.

11:30 A.M. to 11:45 A.M.—Discussion.

11:45 A.M.—Adjourn for Lunch.

Pipe Line Program sponsored by Mid-Continent Cathodic Protection Association. Walter F. Rogers, chairman, Gulf Refining Company.

1:30 P.M. to 1:40 P.M.—"Purposes of Mid-Continent Cathodic Protection Association," by W. F. Rogers, Gulf Refining Company.

1:40 P.M. to 2:00 P.M.—"Method of Determining Whether Electrical Protection Should Be Applied to Pipe Line or Whether the Line Should Be Reconditioned," by D. B. Good, The Texas-Empire Pipe Line Company.

2:00 P.M. to 2:20 P.M.—Discussion.

2:20 P.M. to 2:40 P.M.—"Location and Installation of Ground Beds and the Determination of the Type of Equipment To Be Installed," by D. F. Ball, United Gas Pipe Line Company.

2:40 P.M. to 3:00 P.M.—Discussion.

3:00 P.M. to 3:20 P.M.—Recess.

3:20 P.M. to 3:40 P.M.—"Operation and Maintenance of Motor Generator Sets, Rectox Units, Wind Driven and Gas Engine Driven Units, and the Methods Used in Checking Results Obtained," by David Harrell, Houston Pipe Line Company.

3:40 P.M. to 3:55 P.M.—Discussion.

3:55 P.M. to 4:15 P.M.—"System of Records Maintained to Combat Pipe Line Corrosion," by Frank E. Hangs, The Texas Pipe Line Company.

4:15 P.M. to 4:30 P.M.—Discussion.

4:30 P.M.—Adjourn to Exhibits.

8:00 P.M.—Pipe Line Banquet. Chairmen: J. A. Neath, Humble Pipe Line Company; B. E. Hull, The Texas Pipe Line Company. Main Dining Room, Houston Club.

Drilling and Production Program

Place: Convention Hall

Drilling and Production Committee: G. B. Cosless, chairman, Humble Oil and Refining Company; M. Albertson, Shell Petroleum Corporation; Prof. Benjamin C. Craft, Louisiana State University; Prof. Howard E. Degler, University of Texas; Joe J. King, United Gas Pipe Line Company; Ed Lenzner, ex-officio, Oil-World Exposition; Arthur G. Levy, Fohs Oil Company; Geo. L. Nye, Tide Water-Associated Oil Company; Prof. J. H. Pound, The Rice Institute; Prof. Harry H. Power, University of Texas; James U. Teague, Humble Oil and Refining Company; Prof. Harold Vance, Texas A. & M. College, and Joseph Zaba, Rio Bravo Oil Company.

2:00 P.M.—Prime Movers in Oil Field Operations.
Sponsors: Joe J. King, United Gas Pipe Line Company, and Prof. J. H. Pound, The Rice Institute.
"Power Requirements for Gulf Coast Drilling," by D. M. McCargar, Allis-Chalmers Manufacturing Company.
"The Diesel Engine in Oil Field Service," by O. A. Treiber, Hercules Motors Corporation.
"Maintenance and Lubrication of Bearings in Oil Field Equipment," by S. M. Weckstein, The Timken Roller Bearing Company.
"Positive Control of Lubricating Conditions in Diesel Engines," by J. M. Ravenna and Paul Williams, Skinner Purifiers, Inc.
"Air Cleaners for Oil Field Engines," by C. C. Sowerby, American Air Filters Company, Inc.
"Water Treatment in the Oil Fields," by E. F. Fellows, National Aluminate Corporation.

Geophysical Program

3:00 P. M. and 5:00 P.M.—Geophysical field trip demonstration at Aldine Gardens. American Askania Corporation will make practical demonstration of magnetometer torsion balance, and gravitymeter. Free transportation.

Motor Transportation Program

Place: Assembly Hall, Chamber of Commerce Building.

10:00 A.M.—Session—Motor Transportation Committee.

2:00 P.M.—Session—Motor Transportation Committee.

Entertainment Program, General

12:15 P.M.—Junior Chamber of Commerce Luncheon, Chamber of Commerce Building.

1:00 P.M.—Golf tournament. Ask at Administration Office, Lobby Coliseum.

1:00 P.M. to 6:00 P.M.—Skeet Shooting, Robert J. Miller, supervising. Brae-Burn Skeet Club.

WEDNESDAY, APRIL 26

Host for the Day: John R. Suman, Vice-President Humble Oil and Refining Company.

Directors for the Day: A. M. Blow, Al Buchanan, E. F. Goggins, Dudley Hardcastle, William Keck, L. O. Koen, J. H. McEvoy, Robert J. Miller, C. B. Moore, Daniel J. Moran, George O'Leary, Louis Pearce, Arthur J. Penick, J. L. Shakely, Chase E. Sutton, J. H. Teer, and John A. Worthington.

Refinery Program

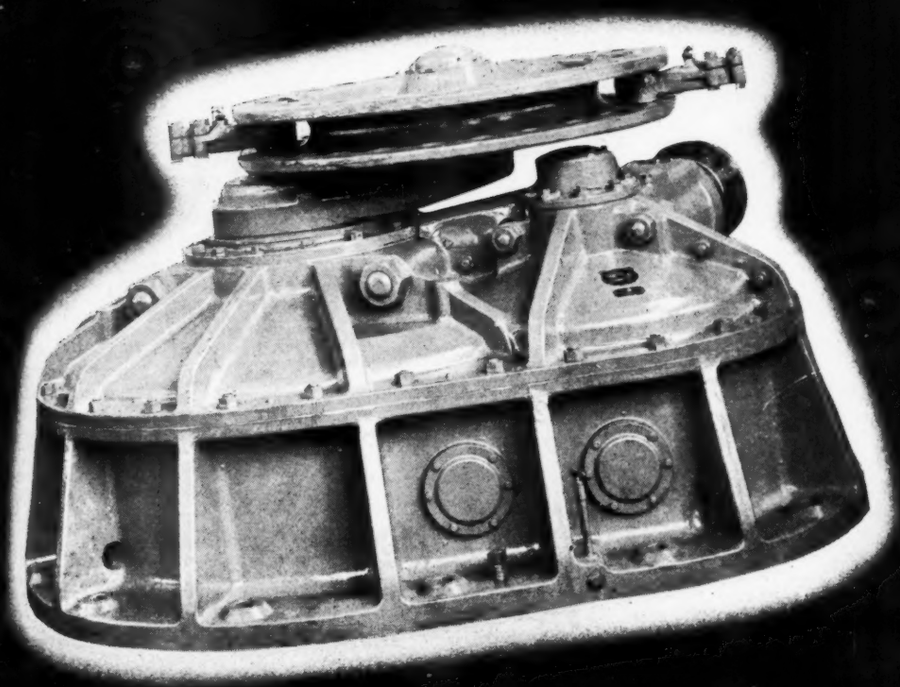
Place: Room D, Balcony Coliseum

Refinery Program Committee: W. H. Curtin,

Announcing a New and Heavier

NATIONAL GEARED POWER

The Type G-150-B for the Heaviest Loads of Central Power Pumping



The Type G-150-B National Geared Power is now available for those areas where the heaviest loads of central power pumping are encountered. This latest and heaviest National Power completes the range of National Geared Power sizes. There is now a National Geared Power for any present day field requirement.

Brief Specifications

Nominal horse power rating at 20 S P M	144
Peak torque rating API at 20 SPM, inch pounds	714500
Stroke lengths	30, 32, 36, 38, 40
Overall Gear ratio	20.2
Number of holes for connections	24

NATIONAL

THE NATIONAL SUPPLY COMPANY

EXECUTIVE OFFICES: Pittsburgh, Pa.

DIVISION OFFICES: Ft. Worth, Texas; Tulsa, Okla.; Torrance, Calif.

GENERAL SALES OFFICE: Toledo, Ohio

chairman, W. H. Curtin and Company; Ed G. Lenzner, vice-chairman, Old-World Exposition.

Instrument Division Committee: R. L. Mallory, sub-chairman, Brown Instrument Division of Minneapolis-Honeywell Regulator Company, Houston; G. B. Lane, district manager, Foxboro Company, Dallas; L. G. Marsh, sales engineer, Taylor Instrument Companies, Tulsa, and Joe Peddie, vice-president, Maintenance Engineering Corporation, Houston.

Morning Session:
R. R. Jackson, chairman, superintendent, Magnolia Petroleum Company, Beaumont, Texas; S. B. Shapiro, vice-chairman, assistant general superintendent, Pan-American Refining Corporation, Texas City, Texas.

10:00 A.M.—"Modern Instrumentation for Topping, Cracking and Polymerization Plants," by Donald J. Bergman, chief engineer, Universal Oil Products Company, Chicago.
"Application of Automatic Controllers to Solvent Refining and Lubricating Oil Plants," by J. F. Thornton, process engineer, and T. T. Whipple, process engineer, The Lummus Company, New York.

Afternoon Session:
John O. Sue, chairman, general superintendent, Gas and Gasoline Department, Humble Oil and Refining Company, Houston; L. K. Laney, vice-chairman, engineer, Producing Department, The Texas Company, Houston.

1:30 P.M.—"Control Practices in Processing Natural Gas," by Henry N. Wade, president, Parkhill-Wade, Los Angeles.
"Theoretical Discussion of Special Control Applications for Fractionating Columns," by A. J. L. Hutchinson, chief design engineer, The Fluor Corporation, Ltd., Los Angeles.

Drilling and Production Program

Place: Convention Hall

2:00 P.M.—Drilling.
Sponsors: Arthur G. Levy, Fohs Oil Company, and Prof. Harold Vance, Texas A. & M. College.
"Core Drills Applied to Oil Field Service," by J. A. Noyes, Sullivan Machinery Company.
"The Baroid High Pressure Drilling Mud Filtration Tester," by D. H. Larsen, Baroid Sales Department, National Lead Company.
"Some Defects Found in Hard-Faced Drilling Tools—And Their Remedies," by C. W. Metzger, Haynes Stellite Company.
"The Tuboscope," by Fritz Huntsinger, Oil Field Machinery and Supply Company.
"Resilient Materials of Construction for the Petroleum Industry," by H. L. Lawrence, DuPont de Nemours and Company, Inc.
"Recent Developments in Oil Well Cements," by J. B. Roberts, Lone Star Cement Corporation.

7:00 P.M.—Student Contest. Convention Hall.
Sponsors: Prof. Howard E. Degler, chairman, University of Texas; Prof. Benjamin C. Craft, Louisiana State University; Prof. J. H. Pound, The Rice Institute; Prof. Harry H. Power, University of Texas, and Prof. Harold Vance, Texas A. & M. College.

Motor Transportation Program

Place: Assembly Hall, Chamber of Commerce Building

10:00 A.M.—Session—Motor Transportation Committee.

2:00 P.M.—Session—Motor Transportation Committee.

7:00 P. M.—Motor Transportation Committee banquet at Houston Club. Number limited to 500. Registration tickets for both day meetings include the banquet. Tickets may be obtained from any of the Motor Transportation Committee men.

7:00 P.M.—Foreign oil men's banquet in honor of visiting foreign oil men, R. L. Dudley, chairman. Rice Hotel Ball Room.

Entertainment Program, General

1:00 P.M.—Golf tournament. Ask at Administration Office.

1:00 P.M. to 6:00 P.M.—Skeet Shooting, Robert J. Miller, supervising, Brae-Burn Skeet Club.

7:00 P.M.—Foreign oil men's banquet in honor of visiting foreign oil men. R. L. Dudley, chariman, Rice Hotel Ballroom.

THURSDAY, APRIL 27

Host for the Day: Wallace Wilson, President Wilson Supply Company.

Directors for the Day: F. M. Austin, L. D. Cain, H. John Eastman, E. W. Gildart, A. C. Glassell, Jr., Harry C. Hanszen, George A. Hill, Jr., O. W. Killam, Harry Leonard, Gage Lund, W. J. Morris, C. E. Naylor, George W. Strake, and Edgar Tobin.

Refinery Program

Place: Room D, Balcony Coliseum

Refinery Program Committee: W. H. Curtin, chairman, W. H. Curtin & Company; Ed G. Lenzner, vice-chairman, Oil-World Exposition.

Heavy Equipment Division Committee: M. N. Dannenbaum, sub-chairman, M. N. Dannenbaum Company; Philip Darling, Pan-American Refining Corporation; Joe Miller, Humble Oil and Refining Company, and H. M. Stewart, Humble Oil and Refining Company.

10:00 A.M.—"Steam Turbines in Refineries and Natural Gasoline Plants," by S. O. Maxwell, Terry Steam Turbine Company, Hartford, Connecticut.
"Applications of Centrifugal Pumps to Refinery Service," by K. P. Hurley, Ingersoll-Rand Company, Houston.

1:30 P.M.—"Recent Developments in Copper Alloy Condenser Tubes," by N. W. Mitchell, Chase Brass and Copper Company, Waterbury, Connecticut.

Drilling and Production Program

Place: Room C, Balcony Coliseum

Sponsors: George L. Nye, Tide Water-Associated Oil Company, and James U. Teague, Humble Oil and Refining Company.
"Development and Future Trend of Controlled Directional Drilling," by M. E. Montrose, Lane-Wells Company.
"Application and Procedure of Controlled Directional Drilling," by C. P. Collins, Eastman Oil Well Survey Company.
"Controlled Vertical Drilling Methods," by J. V. Robinson, Technical Oil Tool Corporation.
"Polar Core Orientation," by D. C. Roberts and E. R. Webb, Sperry-Sun Well Surveying Company.

2:00 P.M.—Well Completion and Production. Convention Hall.
Sponsors: M. Albertson, Shell Petroleum Corporation, and Joseph Zaba, Rio Bravo Oil Company.
"Properties and Uses of 'Securaloy' as Applied to Oil Well Production," by O. Hammer, Security Engineering Company, Inc.
"The Gun Perforator in Oil Well Drilling-Production Problems," by M. E. Montrose, Lane-Wells Company.
"Squeeze Cementing Before Production to Reduce Gas-Oil Ratios," by R. S. Kail, Baker Oil Tools, Inc.
"New Application of Chemistry to Oil and Gas Wells," by P. E. Fitzgerald, Dowell Incorporated.
"Locating of Water Entries in Oil Wells by Electrical Means," by H. C. Yarbrough, Yarbrough Guns Company.
"Modern Sucker Rod Pumping Insures Low Cost Oil Recovery," by D. O. Johnson, The S. M. Jones Company.
"Reda Submergible Electrical Centrifugal Oil Well Pumping Unit," by P. E. Loye, Reda Pump Company.

Drilling Contractors Associated Committee: John R. Suman, Humble Oil and Refining Company; R. G. Bechtel, Stanolind Oil and Gas Company; Don B. Collins, Shell Petroleum Corporation; Wayne Covalt, Amerada Petroleum Corporation; David Frame, Humble Oil and Refining Company; D. E. Legan, Tide Water-Associated Oil Company; A. B. Patterson, The Texas Company; Joe H. Russell, Gulf Oil Corporation; C. S. Sanders, Stanolind Oil and Gas Company; Hugh Stalcup, Skelly Oil Company, and C. E. Sutton, Pure Oil Company.

12:15 P.M.—Luncheon and discussion by drilling contractors.

Safety Program

6:30 P.M.—General Safety Committee stag party. Barbecue and entertainment, for safety engineers, field men, petroleum company employees and their friends. Fred Rousseaux, The Texas Company, Houston, chairman. Kelley's, 910 Texas Avenue.

Geophysical Program

3:00 P.M. and 5:00 P.M.—Geophysical field trip. Demonstration at Aldine Gardens. American Askania Corporation will make practical demonstration of magnetometer, torsion balance, and gravitymeter. Free transporation.

Entertainment Program, General

1:00 P.M.—Golf tournament. Ask at Administration office, Lobby Coliseum.

1:00 P.M. to 6:00 P.M.—Skeet Shooting, Robert J. Miller, supervising, Brae-Burn Skeet Club.

FRIDAY, APRIL 28

Host for the Day: W. B. Sharp, President Mission Manufacturing Company.

Directors for the Day: J. S. Abercombie, John O'H. Anderson, R. A. Broomfield, W. H. Curtin, R. L. Dudley, F. Julius Fohs, Frank L. Hereford, Jack Hoelzel, Thomas Hughes, E. G. Leonardon, A. T. McDannald, R. A. Mueller, Martin O'Brien, R. W. Pack, Nowery J. Smith, and H. E. Treichler.

12:15 Noon—Annual meeting of members and directors of the Oil-World Exposition, Rice Hotel Ballroom.

6:30 P.M.—California Association banquet, Golfcrest Country Club. Tickets may be obtained from S. T. Childress, chairman, or during the Exposition week, at the Administration Offices at the Coliseum.

Safety Program

Place: Convention Hall

T. S. Maffitt, Jr., safety manager, Houston Oil Company, chairman.

10:15 A.M.—"Safety Meetings from Field Men's Viewpoint," by R. M. Bradbury, Houston Oil Company.
"Oil Field Fleet Operations," by M. E. Brock, Gulf Oil Corporation.
Demonstrations. Rescue workmen who go into tanks and inclosed places. S. E. Whiting, Liberty Mutual Insurance Company.

2:00 P.M.—P. E. Keegan, manager personnel and employment, Shell Petroleum Corporation, Houston, chairman.

Speakers: Daniel Harrington, Chief, U. S. Bureau of Mines Safety Section, Washington, D. C.; J. J. Forbes, Chief, U. S. Bureau of Mines Safety Section, Pittsburgh, Pennsylvania.
Demonstrations: Petroleum fires, gases, explosions and permissible equipment by G. M. Kintz, associate engineer, U. S. Bureau of Mines, Dallas, Texas.

7:30 P.M.—C. A. Miller, assistant personnel manager, The Texas Company, Houston, chairman.
"Is Industry at the End of the Road?" by A. A. Nichoson, personnel manager, The Texas Company, New York City.
Presentation of trophies and medals to the petroleum industry's employees who have saved lives of their fellow workmen by first aid and rescue methods by Carl J. Rutland, president, Texas Safety Association, Dallas.

Refinery Program

Place: Room D, Balcony Coliseum

Refinery Program Committee: W. H. Curtin, chairman, W. H. Curtin and Company, and Ed G. Lenzner, vice-chairman, Oil-World Exposition.

Process Division Committee: George Reid, sub-chairman, Editor, "The Refiner"; O. E. Berg, Babcock and Wilcox Tube Company, and Karl E. Luger, Carnegie-Illinois Steel Company.

10:00 A.M.—"Application of Stainless and Heat Resistant Steels in Refineries," by Karl E. Luger, Carnegie-Illinois Steel Company, Houston.
"Resume of Present Development of Alloy Steel Tubes for Pipe Stills," by H. D. Newell, Babcock and Wilcox Tube Company, Beaver Falls, Pennsylvania.

1:30 P.M.—"The Application of the Polyform Process," by Dr. E. R. Smoley, The Lummus Company, New York.
"Progress in Treating and Sweetening," by Dr. C. W. Rippie, Solvay Sales Company, St. Louis, Missouri.
"Oil Refining Going Catalytic," by Dr. Gustav Egloff, Universal Oil Products Company, Chicago.
In addition, the M. W. Kellogg Company has been invited to have a representative appear on this program to discuss catalytic cracking.

Entertainment Program, General

1:00 P.M.—Golf tournament. Ask at Administration Office, Lobby Coliseum.

1:00 P.M. to 6:00 P.M.—Skeet Shooting, Robert J. Miller, supervising, Brae-Burn Skeet Club.

SATURDAY, APRIL 29

Host for the Day: W. L. Childs, Vice-President Reed Roller Bit Company.

Directors for the Day: R. E. Allison, V. E. Ashford, Thomas H. Barton, John T. Crotty, R. C. Gwilliam, R. H. Hargrove, C. A. McCollum, Harry J. Morlang, Joseph S. Morris, M. W. Phelps, Charles F. Roeser, Ed Saltin, Floyd L. Senter, W. D. Shaffer, and T. E. Swigart.

10:00 P.M.—Closing Ceremonies:
Community singing, Convention Hall. Mr. and Mrs. George O'Leary to act as leaders.

Directory of Exhibits for Oil-World Exposition, Houston, Texas

Equipment and supplies of manufacturers exhibiting at the Oil-World Exposition are described in this directory. Hundreds of these items are new or improved and many of them are being shown for the first time. On hand at each exhibit will be representatives to explain and demonstrate the operation of all products. This directory is published to assist those visiting the Exposition to select the exhibits that will be of most benefit to them to see while in Houston.

A-1 BIT COMPANY, INC.
Houston, Texas

Booths Nos. 210 and 212

EXHIBIT: Expanding Casing Cutter and Mill, Universal Wire Line Core Barrel, and all types of rotary fish-tail and drag bits, together with wire line core bits of both drag type and hard formation cone cutter type.

Representatives: C. L. Clausel, C. B. McDonald, E. J. Robishaw, George J. Barrett, and S. Robishaw.

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ABEGG AND REINHOLD COMPANY
Los Angeles, California

Exhibiting in Gulf Engineers, Inc., section.

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ABERCROMBIE PUMP COMPANY
Houston, Texas

Booths Nos. 604 and 705

EXHIBIT: (a) Complete 16¼-in. by 7¼-in. by 20-in. Fluid-Piston Slush Pump, partly disassembled to show various construction features such as the flexible seal sleeve, valve seats that lift out by hand, and integral suction strainer.

(b) Abercrombie Pressure Gauges in various pressure ranges. Also, a working exhibit demonstrating the uniformly steady reading these gauges give in spite of pressure pulsations and mechanical vibration.

(c) A working exhibit of Shear Relief Valves in sizes 1¼ in. to 3 in. and pressure ranges 250 lb. to 2750 lb. Also, shown for the first time, will be the Type "E" Shear Relief Valve for high-pressure gas service such as repressuring plants—valve construction eliminates lateral reaction.

(d) An exhibit of "Conoco" Ball Check Valves.

Representatives: R. B. (Birch) Loggins, Jr., J. A. Tennant, Jr., and M. T. Works.

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ACE DISTRIBUTING COMPANY
Houston, Texas

Booth No. 1009-B (outside)

EXHIBIT: A Fabco tandem drive unit mounted on Ford chassis.

Representatives: H. D. Graf, Sam Camp, Al Stratton, and Julius Feigelson.

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ACME GAS LIFT COMPANY
Houston, Texas

Booths Nos. 244, 246, 248, 345, 347, and 349

EXHIBIT: A complete line of Acme gas-lift equipment ranging in sizes from 1 in. regular to 2½ in. external upset. A glass model will be in operation making visible the construction, operation, and action of the Acme gas-lift.

Representatives: W. L. Church, Edwin Goodwin, F. Dale Reed, and A. F. Peters.

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ADVANCED PETROLEUM EQUIPMENT CORPORATION
Houston, Texas

Booth No. 1024 (outside)

EXHIBIT: A new type of polished-rod hanger that allows a rocking action to relieve the polished rod of some of its strain. A rotating ball-bearing having rotating mechanical action that distributes even wear on rods and tubing. A new type of lubricator and chemical pump having from 1 to 12 sight feeds, which is said to eliminate more than 50 percent of moving parts.

Representatives: J. L. Johnston, Frank Dana, and E. L. Johnston.

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AHLBERG BEARING COMPANY
Chicago, Illinois

Booth No. 1234 (Annex)

EXHIBIT: CJB Master ball bearings in single row, double row, and self-aligning types, both in standard-duty and heavy-duty designs will be shown. The heavy-duty bearings for severe service are equipped with bronze ball retainers of exceptional strength.

Reconditioned bearings will also be displayed in all types, both standard and special for heavy-duty service.

The third line to be shown consists of mounted bearings. New developments in shaft-locking methods and lubricating sealing designs are said to make them desirable for applications where rigidity of revolving members is of serious importance and where dust is a menace to bearing life.

Representatives: P. H. Staerk, F. S. Barkdoll, J. I. Cleveland, G. K. Morgan, and H. D. Whitley.

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AIR-MAZE CORPORATION
Cleveland, Ohio

Booths Nos. 1335 and 1337 (Annex)

EXHIBIT: Will display and demonstrate oil-bath type air filters for internal combustion engines and air compressor applications, and also cleanable, permanent type air filter panels for air-conditioning applications, as well as for installation on internal combustion engines and air compressors.

Representatives: A. D. Barr, southwestern representative, and John Muller of the John Muller Company.

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AIR REDUCTION SALES COMPANY
New York, New York

Booths Nos. 1104, 1106, 1108, 1219, 1221, and 1223

EXHIBIT: Equipment of the following will be displayed: Air Reduction Sales Company, Magnolia-Airco Gas Products Company, National Carbide Corporation, Wilson Welder and Metals Company, Inc., and Crutcher-Rolfs-Cummings. Equipment on display will be Airco oxygen-acetylene, welding and cutting apparatus and supplies, National Carbide and Wilson arc welders.

Demonstrations of casing welding will be conducted throughout the show. The No. 6-A Oxygraph will be used to demonstrate machine gas cutting, and flame-hardening of oil-field equipment also will be demonstrated. The demonstrations of casing welding will be done by the electric arc process.

Representatives: W. A. Sherman, J. F. Pryor, L. A. Hamilton, C. D'W. Gibson, G. Van Alstyne, H. W. Reade, H. L. Rogers, D. F. McCandlish, H. T. Wadley, L. D. Sugg, V. Forgett, T. B. Hasler, I. B. Yates, and E. C. Ackerman.

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ALDRICH PUMP COMPANY
Allentown, Pennsylvania

Booth No. 1341

EXHIBIT: Pressure power pumps including a newly designed pump, either duplex or triplex, having a variable stroke that can be changed while the pump is in operation. A small model of this pump will be in operation.

Representatives: Jay A. Rossiter and Mr. Borneman.

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ALLIS-CHALMERS MANUFACTURING COMPANY
Milwaukee, Wisconsin

Booths Nos. 1035, 1037, and 1064 (outside)

EXHIBIT: Exhibit will be divided into three sections: the Industrial Machinery Division in Booth No. 1035, the Fred E. Cooper exhibit of Allis-Chalmers tractors and winches for the oil industry in Booth No. 1037, and the Tractor Division in Booth No. 1064. The Industrial Machinery Division will have operating demonstrations of centrifugal pumps, speed changer, Texrope drives, mud screen, in addition to exhibits various types of motors, controls, Texrope drives, and centrifugal pumps.

Representatives: D. M. McCargar, and Aubrey Phillips.

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THE ALLSTEEL PRODUCTS MANUFACTURING COMPANY
Wichita, Kansas

Booth No. 1033 (outside)

EXHIBIT: Model R single-drum servicing hoist, powered by Hercules HXE. Model R double-drum drawworks, powered by Caterpillar D-13000. Model K, single-drum servicing hoist powered by Waukesha GAKU. A double-drum Mobilhoist and mast, spudder and rotary drive assembly driven by Buda K-428. Model PG sideboom and blade backfiller mounted on Caterpillar D6 tractor.

Representatives: H. W. Cardwell, president; Arthur Harvey, sales manager; H. W. Cardwell, Jr., R. B. Gilmour, Earl Marsh, D. R. Richardson, B. J. Lorts, and Paul A. Lago, advertising manager.

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ALTEN'S FOUNDRY & MACHINE WORKS
Lancaster, Ohio

Booth Nos. 533 and 535

EXHIBIT: Complete display of the Alten's Pattern Essex Lock Cocks and the Iron Body Stop Cocks. Also various types of tong dies, tubingheads, and stuffing boxes.

Representative: J. E. Bobo.

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ALUMINUM COMPANY OF AMERICA
Pittsburgh, Pennsylvania

Exhibiting in Metal Goods Corporation section.

(Continued on Page 90)

Smith

NOW MANUFACTURES A

full line of

SMITH CASING

A.O.SMITH

PIONEER MANUFACTURERS OF ELECTRIC-WELDED HIGH YIELD CASING • SMITH LINE PIPE • SMITH PRESSURE VESSEL

Casing DOWN TO 5½" O. D.

CORPORATION

Milwaukee, Wisconsin

DISTRICT OFFICES: New York • Pittsburgh • Chicago • Tulsa • Dallas • Shreveport • Houston • Corpus Christi • Los Angeles • San Francisco

(Continued from Page 87)

AMERICAN AIR FILTER COMPANY, INC.
Louisville, Kentucky

Booth No. 666

EXHIBIT: American Cycoil oil bath air cleaners, American Cycoil oil bath gas cleaners, and American unit-type filters. Will have a working model of the Cycoil oil bath air cleaner in operation. Certain sections of this demonstrator are made of celluloid so that the entire operation of the cleaner is visible. In the Cycoil oil bath air cleaner air is mixed with oil and this mixture is subjected to a centrifugal action that removes a large portion of the oil and dust before it enters the filter cell.

Representatives: Wm. K. Gregory, division manager, and Howard M. Fitch, assistant divisional sales manager, both of Louisville; C. C. Sowerby, southwestern division sales manager, Dallas, Texas.

AMERICAN ASKANIA CORPORATION
Houston, Texas

Booth No. 1410 (Annex)

AMERICAN BOSCH CORPORATION
Springfield, Massachusetts

Booths Nos. 105 and 107

EXHIBIT: Magnetos and Diesel injectors will be displayed.

Representatives: Messrs. Mackay and Krommes.

AMERICAN BRASS COMPANY
Waterbury, Connecticut

Exhibiting in Metal Goods Corporation section.

AMERICAN CAST IRON PIPE COMPANY
Birmingham, Alabama

Booth No. 1066-B (outside)

EXHIBIT: Display truck equipped with samples of Mono-Cast Centrifugal Pipe and the latest design of fittings, joints, and accessories. High-pressure tests of pipe and joints, bending tests of pipe, and a machine to illustrate the centrifugal principle of casting Mono-Cast pipe, will be interesting features of the exhibit.

Representatives: H. D. Hughes, manager, Dallas office, and R. E. Magee, Houston representative.

AMERICAN CHAIN AND CABLE COMPANY, INC.
Bridgeport, Connecticut

Booths Nos. 725, 727, 729, 731, and 733

EXHIBIT: American Cable Division, Wilkes-Barre, Pennsylvania, will display various grades of wire rope as used in the oil fields.

American Chain Division, Bridgeport, Connecticut, will display welded and weldless chain items and will feature a new Endurweld chain, an entirely new chain in the line, made exclusively by the American Chain Division.

Reading-Pratt and Cady Division, Bridgeport, Connecticut, will display iron and steel valves.

Wright Manufacturing Division, York, Pennsylvania, will display electric hoists and various types of hand chain hoists.

Representatives:

For American Cable Division: R. D. McNutt, district sales manager; E. L. Klinger, salesman; J. S. Moon, salesman; J. L. Ragan, salesman; G. Moore, salesman, and D. C. Ray.

For American Chain Division: J. B. Taylor, salesman.

For Reading-Pratt and Cady Division: J. Bynum, district sales manager; J. J. Reed, salesman; T. R. Foster, salesman; J. P. Ferguson, assistant general manager of sales, and L. W. Hopkins, sales engineer.

For Wright Manufacturing Division: D. R. Smith, district manager, and D. B. Veit, sales manager.

For Hazard Wire Rope Division: W. W. Runkle, district sales manager; H. S. Frady, salesman; B. N. Burns, salesman, and J. R. McCrea, salesman.

AMERICAN CHAIN DIVISION OF AMERICAN CHAIN AND CABLE COMPANY, INC.
Bridgeport, Connecticut

Exhibiting with American Chain and Cable Company, Inc.

AMERICAN HAMMERED PISTON RING DIVISION OF KOPPERS COMPANY
Baltimore, Maryland

Booths Nos. 204, 206, and 208

EXHIBIT: Numerous types of piston rings, featuring the surface treated ring for quick seating and anti-scuffing, the Gold Seal Ring, and several improvements in connection with the slotted types of oil rings for better oil control.

Representatives: John A. Worthington, J. M. Fuller, W. P. Cunningham, E. S. Freeman, Jr., and Bart Aldridge.

AMERICAN INSTRUMENT COMPANY
Silver Spring, Maryland

Exhibiting in Industrial-Scientific Supply Company section.

AMERICAN IRON AND MACHINE WORKS COMPANY
Oklahoma City, Oklahoma

Booths Nos. 428 and 430 (Coliseum)
Booth No. 1017-B (outside)

EXHIBIT: American pump valves and seats, release valve, pump manifold valve, pump compound valve, drill pipe elevator, improved stripper type tubinghead, and models of other equipment.

Representatives: J. F. Cailloux, president; Earl W. Miller, vice-president and treasurer; George S. Hinkle, assistant secretary and district manager; Fred Ryals, assistant district manager Gulf Coast; John R. Riley, assistant secretary; L. D. Murray, P. K. Ridge, and O. L. Garrett, salesmen.

AMERICAN-LA FRANCE-FOAMITE CORPORATION
Elmira, New York

Booths Nos. 742 and 744

EXHIBIT: The Poweron Nozzle will be introduced at the American-LaFrance-Foamite exhibit. Details will be shown of the safe use of the Poweron on electric equipment to 250,000 volts. This device is also effective on flammable liquid fires, as well as fires in ordinary free burning materials, the makers state. This new water spray nozzle has the triple Underwriters' rating—"A-B-C".

American-LaFrance-Foamite will also display their complete line of Alfite carbon dioxide and Foamite portable and semi-portable devices.

Representative: D. D. Fitzgerald, district manager.

AMERICAN METER COMPANY
Erie, Pennsylvania

See exhibit of Westcott and Greis, Inc.

AMERICAN PIPE AND STEEL CORPORATION
Alhambra, California

Booth No. 1133 (Annex)

EXHIBIT: The American Seam Tester will be displayed and a limited number of bakelite samples of the Unitank Flange will be given to those desiring them. Also, copies of a bulletin on Armor-Clad will be distributed.

Representatives: John McMillan, sales manager, and Keith Galvin.

AMERICAN SAND-BANUM COMPANY, INC.
New York, New York

Booth No. 232

EXHIBIT: Displaying Sand-Banum colloidal concentrates, which the makers state are entirely different scale and corrosion eliminants. Standard Sand-Banum eliminates scale and corrosion formation in boilers. Blue Seal Emulsion Sand-Banum does the same for the cooling systems of internal combustion engines. Sand-Banum Special, in tablet form, eliminates scale and corrosion formation in radiator circulating systems of Diesel engines, autos, trucks, tractors, etc.

Representatives: L. Bradie, New York, secretary and treasurer; Frank J. Welu, division manager of Western Sand-Banum Company, and Paul P. Elliott.

AMERICAN STEEL AND WIRE COMPANY
Cleveland, Ohio

See exhibit of United States Steel Corporation Subsidiaries.

Representatives: P. T. Coons, C. F. Wiley, H. R. Klein, R. M. Peterson, T. A. Goggin, C. L. Richardson, S. Doan, O. Kroeger, E. T. Eggers, J. V. McGinity, H. Riddle, and D. Carlton.

AMERICAN WELL AND PROSPECTING COMPANY
Corsicana, Texas

Booth No. 1016 (outside)

EXHIBIT: Equipment to be exhibited is as follows:

Gumbo Buster 17½-in. oil-bath rotary, a fully-enclosed, high-speed rotary designed for shallow or medium depth drilling.

Gumbo Buster FC-200 drawworks, designed for use with one or more internal combustion engines of a total maximum of 200 hp.

Gumbo Buster G-14 power-driven slush pump.

Gumbo Buster 7-36 crown block, designed for medium depth wells and to handle safely 125 tons.

Gumbo Buster 7-36 traveling block, designed for medium depth wells and to handle safely 125 tons.

Gumbo Buster 5.75-30 crown block, designed for shallow depth drilling and to handle safely a load of 80 tons.

Gumbo Buster 5.75-30 traveling block, designed for shallow depth wells and to handle safely 80 tons.

Gumbo Buster 4-in. oil-bath swivel, designed for shallow depth drilling and to operate under a maximum load of 45 tons at 100 r.p.m.

Gumbo Buster engine skid units.

Rotating elements. The Gumbo Buster rig to be exhibited will be equipped with the latest type Allis-Chalmers Texrope Drive Rotating Elements.

Representatives: J. E. Rittersbacher, president; Edgar Rittersbacher, vice-president; L. R. Estes, secretary; Eliot Johnston; Carl M. Anderson, chief engineer; H. E. Redden, plant superintendent; Lee Fagg, field engineer; Oscar C. Hohl, Houston district manager; Staley Kessinger, field service man, and Floyd (Shorty) Clift, field service man.

ARCOS CORPORATION
Philadelphia, Pennsylvania

See exhibit of Gil V. Dye Company.

ARMSTRONG MACHINE WORKS
Three Rivers, Michigan

Booth No. 1564 (Annex)

EXHIBIT: A glass model of the Armstrong Trap operating at 5 lb. steam pressure, and a black light exhibit showing the operating cycle of the trap. In addition, will dis-

(Continued on Page 94)

YOU ARE CORDIALLY INVITED TO VISIT OUR EXHIBIT

Oil-World Exposition

Featuring a complete display of products for mud testing and control. Interesting—Informative. DON'T MISS IT!

BAROID PRODUCTS

BAROID—Extra-Heavy Drilling Mud. • AQUAGEL—Trouble-Proof Colloidal Drilling Mud. • STABILITE—An Improved Chemical Mud Thinner. • BAROCO—An Economical, Salt Water-Resisting Drilling Clay. • FIBROTEX—For Preventing or Regaining Lost Circulaton. • DISPERSO—For Reconditioning Cement Cut Muds. • AQUAGEL for CEMENT—For setting casing and restoring lost circulation. • ZEOGEL—Special Clay To Be Used As A Suspending Agent When Salt or Salt Water Are Encountered. • TESTING EQUIPMENT—For drilling mud analysis and control.

Stocks carried and service engineers available in all active oil fields. Look for this trade mark under "Oil Well Drilling Mud" in your classified telephone directory for our nearest service engineer and distributor.

BAROID SALES DEPARTMENT

NATIONAL PIGMENTS & CHEMICAL DIVISION OF
NATIONAL LEAD COMPANY

BAROID SALES OFFICES • LOS ANGELES • TULSA • HOUSTON

(Continued from Page 90)

play models of piston-operated traps designed for large volumes of condensate, and a model of the forged-steel trap for high-pressure steam and removing water from high-pressure natural gas lines.

Representatives: Otho E. Ulrich, T. H. Rea, and George B. Allan.

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ASBESTOS MANUFACTURING COMPANY
Huntington, Indiana

Exhibiting in Manning Oil Specialties section.

•

ASHTON VALVE COMPANY
Boston, Massachusetts

Exhibiting with Maintenance Engineering Corporation.

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ATLAS ENGINEERING WORKS
Houston, Texas

Booths Nos. 424, 426, 525, and 527

EXHIBIT: Atlas Custom Assembled Christmas trees built on the patented Atlas Types A-3 and A-3 combination heads will be displayed, together with conventional types of tubingheads and bradenheads, forged-steel fittings, adjustable and positive flow beans, automatic shut-off valves, unions, repaired valves and a portable hydraulic tool. Other new items are being prepared for display that are said to be revolutionary in design.

Representatives: Ernest L. Barker, J. R. Barrett, Jack Garrison, G. F. Dunning, Mike Hopper, and W. V. Currie.

•

ATLAS PRESS COMPANY
Exhibiting in Egner Brothers section.

•

ATLAS SUPPLY COMPANY
Muskogee, Oklahoma

Booths Nos. 1412, 1414, and 1416 (Annex)

EXHIBIT: Equipment to be shown includes the Atlas No. 401 shallow-well pumping unit, driftmeter No. B63 radiator cooling unit, Weber, Type F, 25-hp. vertical gas engine, and Wheeling tubular products.

The Atlas No. 401 pumping unit is the smaller of two new sizes of shallow-well pumping units recently introduced, and features a double reduction roller chain speed reducer.

The Driftmeter No. B63 radiator cooler is the smaller of eight new models of radiator coolers recently offered by Driftmeter, Inc., and ranging in capacities from 35 hp. to 90 hp.

The Weber, Type F gas engine is being exhibited for the first time at the Oil-World Exposition. It is a single-cylinder, 2-cycle, vertical gas engine, having a 7½-in. bore and 9-in. stroke, rated 25 hp. at 550 r.p.m.

Representatives: H. U. Everett, district manager of Texas, Fort Worth; Ben L. Jones, Houston, Texas, representative; Bruce E. Gold, engineer, Tulsa, Oklahoma; J. R. Brooks, vice-president and secretary, Muskogee, Oklahoma; W. G. Burnside, vice-president, The Steel Products Company, Iola, Kansas, and E. Tyler Davis, assistant general manager of sales, Wheeling Steel Corporation, Wheeling, West Virginia.

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AXELSON MANUFACTURING COMPANY
Los Angeles, California

Booths Nos. 350 to 457 (Annex). (In Frick-Reid Supply Corporation section)
Booths Nos. 1630, 1632, and 1634 (Annex)

EXHIBIT: Display will consist of a complete line of Axelson deep-well plunger pumps, including the new Sure-Seal and Kup-Pak pumps.

In addition to the pumps, the improved On-Or-Off Attachment will be displayed. This unit provides a means of connecting or disconnecting the sucker rods as desired, thereby eliminating stripping jobs when the pump becomes sanded-up or stuck.

The new Axelson Heavy-Duty Standing Valve Puller, incorporating many new features, will also be included in the exhibit.

The Axelson multiple standing valve with tubing bleeder will be shown. The arrangement of several relatively small A.P.I. valves working in parallel provides a larger fluid capacity, less ball lift, faster valve action, and imposes a lighter load on each valve than is possible in the single larger valve generally used, the makers assert. This unit, in addition to being an effective valve, provides a convenient means of bleeding the tubing without pulling the rods or tubing.

The new Axelson full-floating stuffing box will be shown in detail.

Axelson sucker rods, couplings, the improved sucker rods guides, and the new Axelson No. 70 single joint pull rods will also be displayed in the Axelson exhibit.

The pump and accessory display will be in the Frick-Reid exhibit—Booths Nos. 350 to 457 in the main auditorium building.

Axelson is also exhibiting 14-in. and 24-in. heavy-duty lathes, designed and constructed completely by the Axelson Manufacturing Company. Actively engaged in the designing and manufacturing of lathes for more than 20 years, Axelson now displays their latest and most complete line of lathes. The lathe exhibit will be in Booths Nos. 1630, 1632, and 1634 on the ground floor annex.

Representatives: J. C. Axelson, president; D. F. Axelson, vice-president; D. M. Hammett, vice-president; A. G. Haglund, vice-president; M. F. Smith, sales engineer; E. W. Brant, factory representative, and P. I. Layman, factory representative.

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AYRES ENGINEERING COMPANY
Houston, Texas

Booths Nos. 409 and 411

EXHIBIT: Janney Cylinder Company's centrifugally-cast metals for use in the oil industry, pump sleeves, cylinder liners, etc.

Representatives: R. O. Ayres and C. R. Spare.

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BAASH-ROSS TOOL COMPANY
Los Angeles, California

Booths Nos. 512 and 514

EXHIBIT: Type "W" casinghead, a new product using a welding ring instead of slips as the means of suspending the casing.

Self-Aligning Rotary Slips, employing a new principle whereby the liners are automatically adjusted to take and maintain a full length positive grip, the weight of the drill pipe being uniformly distributed over their entire gripping area.

Spelts Cylinder for 2-stroke cycle gas engines, a replacement cylinder new in principle, designed to be attached to engines without need of special parts.

Streamline tubing block.

Open-end tubing spider.

Wire-line wiper.

Representatives: L. F. Baash, president; H. C. Ross, vice-president; A. F. Brown, vice-president; H. J. Craig, Mid-Continent manager; O. E. DeLange; Harry Slayback; Gene Buckner; Noel Dalton, and Chas. Carothers.

•

BAILEY METER COMPANY
Cleveland, Ohio

Booth No. 1324 (Annex)

EXHIBIT: Meters and controllers, together with diagrams illustrating their application for the control of tube-still furnaces in accordance with temperature, in situ density, and yield-per-pass.

Representatives: H. M. Hammond, manager of sales and engineering, and C. M. Kunkel, manager of the Houston branch office.

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J. T. BAKER CHEMICAL COMPANY
Phillipsburg, New Jersey

Exhibiting in W. H. Curtin and Company section.

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BAKER OIL TOOLS, INC.
Huntington Park, California

Booths Nos. 100, 101, 102, and 201

EXHIBIT: A complete display of the Baker line of cement guiding, floating, and cementing equipment. Cutaway sections of shoes and collars show the drillable internal construction resulting from the use of Baker Formula Concrete and Bakelite; demonstrate the efficiency of the ball-type back-pressure valve in the floating mechanism, and clearly illustrate the effectiveness of the whirler action in the various "whirler type" Baker cement shoes and collars. Cement hook-ups with metal "petal" baskets for protection of sands and perforations also will be exhibited in various combinations.

Of particular interest is a demonstration unit that shows the actual operation and results obtained from the wash-down whirler action provided by Baker Cement Wash-Down Whirler Float Shoes and Wash-Down Guide Shoes. This demonstrator pumps fluid downward through the Wash-Down Whirler Shoe and out the baffled whirler ports that force the fluid downward at a slight inclination sufficient to produce a whirling motion. This whirling action is used to effectively remove bridges and wash the casing down as it is being run into the hole; to wash the formations preparatory to cementing, and to insure the best possible encasement of the pipe with a uniform body of cement.

A Baker Model "K" Cement Retainer will be displayed having a section of the body cut away to show the operating mechanism of the tool. The setting procedure and use of this tool for cementing operations and as a casing bridge plug are shown both by the cutaway tool and by a series of large-scale illustrative wall drawings. Here also are depicted a number of the more popular applications of the Cement Retainer, such as typical squeeze jobs requiring high pressures, shutting-off bottom water below the oil sand, reducing gas/oil ratios, use of tail pipe, etc.

A Baker Rotary Hydraulic Expansion Wall Scraper also will be on display having a section cut away to demonstrate the opening and closing of the blades under actual operating conditions. The conversion of a Baker Wall Scraper into a Baker Wall Sampler by merely substituting sampler blades equipped with core-taking tubes for the scraper blades will be demonstrated.

Other equipment to be exhibited includes the Baker Hydraulic Core Extractor and Testing Pump, Baker Portable Hydraulic Kelly and Pipe Straightener, and Baker Bakwik Model "B" Drill Pipe Floats. All these tools and devices will be set up for operation at the booth.

Representatives: T. Sutter, vice-president and general manager, Huntington Park, California; C. E. Whitney, general sales manager, Houston, Texas; C. E. Burt, chief engineer, Huntington Park; G. M. Anderson, California sales manager, Huntington Park; W. A. Davis, Houston; R. S. Kail, Houston; W. H. Griffin, Houston, and W. E. Routt, Houston.

(Continued on Page 97)

BALDWIN-DUCKWORTH CHAIN CORPORATION
Springfield, Massachusetts

Booths Nos. 314 and 316

EXHIBIT: A complete line of Baldwin oil field chains will be exhibited, particularly featuring Baldwin No. 3125 3⅛-in. pitch chain in single and double widths and Baldwin 1244-SS Master chain. Baldwin Super Service and Full Flex series also will be exhibited. The Baldwin patented flexible chain coupling will be featured, as well as the complete line of roller chains in all sizes and widths as used on all types of oil field equipment.

Representatives: George J. Fix, Sr., in charge of exhibit; F. J. Weschler, treasurer and general manager; George D. Gilbert, sales manager; Hermann Klaucke, chief engineer, Worcester plant; J. F. McCann, chief engineer, Springfield plant; A. T. Arnold, advertising manager; George J. Fix, Jr., J. H. Turner, H. J. Mills, and H. W. Young, sales representatives.

●

BANTAM BEARINGS CORPORATION
South Bend, Indiana

Booths Nos. 1110 and 1112 (Annex)

EXHIBIT: A number of stock and special bearings used in oil field service and descriptions of their various applications. Of particular interest to petroleum engineers, production men, and others will be the Bantam line of quill bearings applicable to pumping units, etc. The parent firm, The Torrington Company, Torrington, Connecticut, also will have a display of their bearings in the Bantam booths.

Representative: C. A. Benson, manager of the Dallas, Texas, branch office, in charge.

●

BARCO MANUFACTURING COMPANY
Chicago, Illinois

Exhibiting with M. N. Dannenbaum

EXHIBIT: Various types of Barco joints will be displayed and flexible hook-ups to show method of application.

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BAROID SALES DEPARTMENT
National Pigments and Chemical Division of
NATIONAL LEAD COMPANY
Los Angeles, California

Booths Nos. 224 and 325

EXHIBIT: The central theme of the exhibit will be built around a color slide film story of Baroid's service in the oil industry. In this series of color slides will be shown the mining of products, processing at the mills, the research work in the company's laboratories, the services performed by field engineers at the wells, the application of materials to the mud system, and close-up pictures showing technical testing equipment in operation. Besides this will be demonstrated the new Baroid High-Pressure, High-Temperature Wall-Building Tester and various pieces of testing equipment for analyzing the workability of drilling mud. Results obtained from tests made with all these units also will be displayed.

Representative: G. L. Ratcliffe, general manager of the Baroid Sales Department, will be in charge.

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BEARD AND STONE ELECTRIC COMPANY
Houston, Texas

Will cooperate with several manufacturers, for whom they are Southwest representatives, in their exhibits, as follows:

American Bosch Corporation will exhibit its magneto and Diesel injector lines in Booths Nos. 105-107 and in addition to their Mr. Mackay, Mr. Krommes of Beard & Stone will be in the booth.

The Wico Magneto Corporation will show their magneto line in Booth No. 657 and Lee Traweek of Beard & Stone will assist Leon Smith. The latter is district representative for Wico in the Southwest.

The Bendix Corporation will exhibit in Booths Nos. 143-145 and Mr. Inglis of Beard & Stone will be in the booth, along with a factory representative of Bendix.

●

BEAUMONT IRON WORKS
Beaumont, Texas

Exhibiting in Frick-Reid Supply Corporation section.

●

BEAVER PIPE TOOLS, INC.
Warren, Ohio

Booth No. 745

EXHIBIT: The full line of Beaver pipe cutting and threading tools and machines. The company's newest creation, the Model-C, will be the center of attraction.

Representatives: Harris Carlock, southern district manager, Atlanta, Georgia, and C. W. Smith, oil field district manager, Houston, Texas.

●

BECK ENGINEERING COMBUSTION COMPANY
St. Louis, Missouri

Exhibiting with Bettis Sales Company.

●

BECKER, INC., CHRISTIAN
New York, New York

Exhibiting in W. H. Curtin and Company section.

●

BENDIX AVIATION CORPORATION
ZENITH CARBURETOR DIVISION
Detroit, Michigan

Exhibiting in Scintilla Magneto Company section.

●

BENDIX PRODUCTS CORPORATION
South Bend, Indiana

Exhibiting in Transportation Equipment Company section.

●

BERGER MANUFACTURING DIVISION
REPUBLIC STEEL CORPORATION
Canton, Ohio

Exhibiting in Republic Steel Corporation section.

●

BERYLLIUM COPPER CORPORATION
Reading, Pennsylvania

Exhibiting in E. D. Bullard Company section.

●

BETHLEHEM INTERNATIONAL SUPPLY COMPANY
Tulsa, Oklahoma

Exhibiting with Bethlehem Steel Company, Inc.

●

BETHLEHEM STEEL COMPANY, INC.
Bethlehem, Pennsylvania

Booths Nos. 548, 550, 552, 554, 556, and 560

EXHIBIT: Seamless casing and tubing, sucker rods, alloy and corrosion-resisting bolting material, wire rope and strand, tool joints, pump liners, Mayari R, high-strength, and low-alloy steel.

Representatives: From Bethlehem: J. V. Honeycutt, assistant vice-president; J. M. Ellis, general manager of sales; E. A. Buxton, manager of sales, pipe and tubes; C. R. Zimmerman, selesman, and T. J. Fitzgibbons, salesman. From Detroit: W. B. Topping, general manager, western sales. From St. Louis: B. C. MacGregor, manager of sales. From Tulsa: G. A. Tompson, vice-president, Bethlehem International Supply Company, and R. G. Ayers, general manager of sales. From Houston: J. E. Moore, manager of sales; E. C. Crider, salesman; E. F. Seaman, salesman; A. B. Harrison, salesman, and T. R. Miller, salesman.

BETTIS SALES COMPANY
Houston, Texas

Booths Nos. 1405, 1409, and 1411

EXHIBIT: Equipment of the following manufacturers will be displayed:

The Pyle-National Company, Chicago, Illinois, steam turbine generators sizes ½ kw., 5 kw., 12 kw., steam turbines sizes ¼-2½ hp., 2-5 hp., and 10-25 hp. Floodlights for rig and barge sizes 10 in., 14 in., and 23 in. Gas turbine centrifugal pump for clean-out and salt water circulation. Explosion and vapor-proof fittings.

Beck Engineering Combustion Company, St. Louis, Missouri, Melloblu low-pressure gas burner unit for 125-hp. boiler.

Texsteam Corporation, Houston, Texas, Safety valves for steam and gas. Chemical Pressure Injector, gas operated, and boiler fittings.

●

BIG THREE WELDING EQUIPMENT COMPANY
Houston, Texas

Booths Nos. 735, 737, 739, and 741

EXHIBIT: Lincoln Electric Company, 300 amp. motor generator, SAE Type, electric arc welder; 150 amp. motor generator, SAE Type, electric arc welder; 300 amp., Diesel, SAE Type, electric arc welder; 300 amp., gasoline generator, SAE Type, electric arc welder; 500 amp., motor generator, SAE Type, electric arc welder, and Lincon-ditioner.

Full line of Lincoln Fleetweld electrodes and accessories.

Representatives: B. K. Smith, president; B. J. Brugge, sales manager; A. K. Smith, H. K. Smith, L. L. Daigle, G. B. Denney, A. W. Benn, and R. F. Hodges, all sales representatives.

●

BLACK, SIVALLS AND BRYSON, INC.
Oklahoma City, Oklahoma

Booths Nos. 450, 452, 454, and 456

EXHIBIT: Products to be displayed include the following B S & B equipment: Automatic chemical feeder, safety-head, flow pressure regulator, 1500-lb. working pressure A.P.I.-A.S.M.E. Code oil and gas separator, 125-lb. working pressure A.P.I.-A.S.M.E. Code oil and gas separator, tubular treating heater, horizontal fire-tube heater, pipe-line oil seal valve, "Long John" thief valve, diaphragm-operated back-pressure gas valves, pilot-controlled oil valves, equalizing thief valve, riser-type vent valve, and straight-through vent valve.

Representatives: A. H. Black, president; Glenn Skinner, vice-president; G. Raymond, chief engineer; A. J. Edwards, sales manager; Gurney Peoples, division manager; R. E. Stevens, South Texas sales manager; H. R. Bethel, West Texas sales manager; H. B. Fessler, Louisiana sales manager; G. C. Parmlee, sales representative; Geo. Smith, sales representative, and L. M. Tidd, treasurer.

●

J. E. BOBO
Houston, Texas

Booths Nos. 533 and 535

EXHIBIT: Products of the following manufacturers will be displayed:

Thos. Devlin Manufacturing Company, Burlington, New Jersey, pipe fittings.

Marshalltown Manufacturing Company, Marshalltown, Iowa, pressure gauges.

Dixon Valve and Coupling Company, Philadelphia, Pennsylvania, hose couplings.

Goodall Semi-Metallic Hose and Manufacturing Company, Philadelphia, Pennsylvania, rotary hose.

Alten's Foundry and Machine Works, Lancaster, Ohio, stop cocks and oil field specialties.

Representative: J. E. Bobo.

WILLIAM BOEKEL AND COMPANY
Philadelphia, Pennsylvania

Exhibiting in W. H. Curtin and Company section.

BOILER EQUIPMENT SUPPLY COMPANY
Oklahoma City, Oklahoma

Exhibiting in Well Equipment Manufacturing Corporation section.

BONNEY FORGE AND TOOL WORKS
Allentown, Pennsylvania

Booth No. 1417 (Annex)

EXHIBIT: Full line of Bonney wrenches and tools that have particular application in the oil fields, including sockets with detachable handles and attachments, box wrenches, open end wrenches, pliers, screw drivers, punches, chisels, and hammers.

Representatives: Ron Wixson and Jean DuBois.

H. E. BOWMAN COMPANY
Houston, Texas

Exhibiting in W. L. Walker Company, Inc., section.

S. F. BOWSER AND COMPANY
Fort Wayne, Indiana

Exhibiting in Hanlon-Waters, Inc., section.

BRANCE-KRACHY COMPANY
Houston, Texas

Booths Nos. 1216, 1218, 1319, and 1321 (Annex)

EXHIBIT: Power transmission equipment and cathodic protection equipment.

Representatives: J. D. Brance, A. C. Krachy, L. J. Wallace, Tom Evans, C. J. Mueller, and G. W. King.

THE BRANDON COMPANY
Odessa, Texas

Booth No. 1403 (Annex)

EXHIBIT: Will show products made by Exner-Dodge Packer Company, Coffeyville, Kansas; equipment manufactured by Norris Brothers, Inc., Robinson, Illinois; and equipment manufactured by Baird Manufacturing Company, Tulsa, Oklahoma.

Will feature the new underset formation packer and other new type packers made by Exner-Dodge. This formation packer hangs in the well casing and packs-off in the formation and can be moved up and down the hole without having to come out of the hole to find a pack-off point; also it can be made a double packer to be operated the same way. Super hook wall packer, a new type of corrosion finish that Exner-Dodge are using on all swages, bull plugs, casing nipples, and any other fitting they manufacture also will be shown.

Baird Manufacturing Company will exhibit some new type corrosion-resisting monel balls and seats, and their new type sucker rod tap and dies.

Representatives: Thomas E. Brandon, The Brandon Company; R. E. Fulkerson and Frank Denison, Exner-Dodge Packer Company.

BRIDGEPORT MACHINE COMPANY
Wichita, Kansas

Booths Nos. 1010-B and 1015 (outside)

EXHIBIT: Virtually everything shown will be equipment developed during the last two years, none of which has ever been demonstrated at an oil show. Among the items is the new Bridgeport-Pratt Portable Oil Treater, which will be in operation; both a single-drum and a double-drum Bridgeport Well Servicing Unit; a Bridgeport Series TDLS Model G Portable Rotary Drilling Rig; a Bridgeport Chain Driven Pumping Unit, and the complete line of Gumbo Buster equipment distributed for the American Well and Prospecting Company. Most of this equipment will be rigged up and in operation so that visitors can observe it in action.

Representatives: B. B. Root, vice-president and general manager; L. A. Babb, vice-president and sales manager; F. K. Blauvelt, vice-president and plant superintendent; L. V. Brown, assistant sales manager; R. W. Walters, superintendent of sales; J. W. Wiley, chief engineer; Fred Parks, manager of stores; F. R. House, manager Dallas office; J. M. Welch, manager San Antonio office; W. H. Turnage, Houston manager; E. H. Butler, Houston sales representative; and I. C. Lawless, publicity director.

BRIGGS CLARIFIER COMPANY
Washington, D. C.

Booth No. 1569

EXHIBIT: Equipment displayed will consist of Model D-2 Clarifier cutaway to show construction details. This clarifier is for the clarification of lubricating and fuel oil in stationary Diesel and natural gas engines.

A model D-1 Clarifier also suitable for either fuel or lube oil clarification in stationary engines will be shown.

In addition, there will be a Briggs Model F-5 fuel oil clarifier suitable for Diesel engines having a maximum fuel consumption of five gal. per hour.

Cutaway sections of G-600 and G-800 lube oil clarifiers for heavy-duty gasoline engines and light Diesels will be shown along with photographs of actual Briggs Clarifier installations in all types of service.

Representatives: Dunman Perry, field engineer; Robert G. Taylor, field engineer; Walter A. Frazier, sales representative, and A. C. Stanfield, sales representative.

THE BRISTOL COMPANY
Waterbury, Connecticut

Booth No. 1

EXHIBIT: Instruments of telemetering and the remote control of processes in the oil industries will be exhibited, featuring pneumatic reset control. Bristol's Reset Free Vane Pneumatic Controllers are for temperature, pressure, vacuum, flow or liquid level and are equipped with simple throttling-range and automatic-reset adjustments. Temperature and liquid level reset controllers will be shown.

Bristol's line of Pyromaster Round-Chart Potentiometer Recorders and Controllers will also be featured. One of these instruments will be shown with a transparent cover to indicate the new principle involved and the simplicity of the operating mechanism.

Other instruments to be exhibited include Bristol's Wide-Strip Potentiometer Multiple-Point Recorder and Air-Operated Valve Positioner.

Representatives: H. E. Beane, A. A. Blackman, H. A. Van Hala, D. D. Ault, R. A. Barnes, and E. H. Hart.

BRODERICK AND BASCOM ROPE COMPANY
St. Louis, Missouri

Exhibiting with Continental Supply Company.

EXHIBIT: Attractive exhibit of miniature wire rope machines, showing the actual manufacture of small sizes of wire rope.

Representatives: D. Larkin, general manager; D. E. Dickey, research engineer; Fred Zimmerman, sales manager; M. R. Gayle, Mid-Continent sales manager, and R. A. Hill, Houston manager.

THE BROWN INSTRUMENT COMPANY
A Division of Minneapolis-Honeywell Regulator Company
Philadelphia, Pennsylvania

Booth No. 755

EXHIBIT: Indicating, recording, and control instruments for the regulation of temperature, pressure, flow and liquid level in refinery processes. Featured in this exhibit will be a working demonstration showing an indicating transmitter, equipped with the Brown Pneumatic Remote Transmission System by which temperature, pressure, flow and liquid level measurements may be indicated, recorded, and controlled remotely. The Brown combined electric and air-operated flow and liquid level system for remote transmission will also be in operation in connection with the particular display.

Other Brown instruments mounted on the centralized control panel board in operation, include: Brown Multiple Recording Potentiometer Pyrometer, Brown Air-o-Line Controller, and Brown Flow Meters.

Representatives: E. B. Evleth, vice-president and general manager; L. Morton Morley, vice-president and general sales manager; R. L. Mallory, Houston; E. B. Kohl, Houston; R. W. Groendycke, Houston; F. A. Rodgers, Dallas; R. P. Walker, Tulsa; M. Petty, Dallas, and R. A. Weikel, Philadelphia, all sales engineers.

BROWN OIL TOOLS, INC.
Houston, Texas

Booth No. 1109 (Annex)

EXHIBIT: Equipment displayed will include canvas packers, control head packers, hook wall packers, liner setting tools, whipstocks, cutting tools and spears, tubingheads, bradenheads, tubing hangers, and liner cementing tools.

Representatives: C. C. Brown, president; A. S. Baylor, chief engineer; R. E. Morwood, manager cutting tool department; J. W. Hindman, engineer; F. L. Scott, Jr., engineer; F. E. Conway, salesman, and E. L. Bass, sales manager.

THE BUDA COMPANY
Harvey, Illinois

Booths Nos. 732, 734, and 736

EXHIBIT: Oil field power units, oil field jacks, and other equipment used in the production of oil. The Buda Engine and Equipment Company will exhibit in conjunction.

BUDA ENGINE AND EQUIPMENT COMPANY
Harvey, Illinois

Booths Nos. 732, 734, and 736

EXHIBIT: Exhibiting in conjunction with The Buda Company.

BUFFALO METER COMPANY
Buffalo, New York

See exhibit Westcott and Greis, Inc.

U. S. BUREAU OF MINES
Washington, D. C.

Booths Nos. 1611, 1613, and 1615

EXHIBIT: Display will include equipment for demonstrating the various activities of the Health and Safety Branch and the Petroleum Division of the Federal Bureau of Mines in the Mid-Continent area. This will include the equipment used for conducting the Bureau of Mines course on the safe handling of gases that occur in the petroleum industry, which was inaugurated in January of this year. Interesting equipment of this course shows how gasoline vapors may travel and be ignited; a flame burning in an atmosphere of pure natural gas; and a chamber for demonstrating ignition temperatures of gases and the hazards of using unapproved electric hand lamps.

Besides the above equipment, the Bureau of Mines rescue truck will be exhibited, as well as a model of the Federal Bureau of Mines helium plant at Amarillo, Texas; a revolving wheel showing crude oils from various parts of the world; lifesize manikins demonstrating artificial respiration; cut-away section of a bottom-hole pressure

PLENTY! JUST LISTEN TO TRINITY INFERNO'S RECORD FOR 1938 IN COTTON VALLEY, LA.

Average depth 8200'
Average Bottom Hole Temperature 228°

Under these tough conditions of depth and high temperature Trinity Inferno came through with perfect cement jobs on well after well.

Oil String Cemented with as much as 1200 Sacks

Although experienced operators thought 800 sacks would be maximum under existing conditions, Trinity Inferno made it possible to get up to 1,200 sacks behind the oil string.

42 Inferno Cemented Wells
42 Perfect Cement Jobs

One or two successful jobs might be attributed to luck. But 42 perfect cement jobs, at average depths of 8,200'—with average bottom hole temperatures of 238°, is certain *proof* of TRINITY INFERNO'S *uniform* dependability. This is but one of *many* performance records proving that TRINITY INFERNO remains fluid at high temperatures until placed and then provides a dense, impermeable, "set" slurry which permits drilling out within 48 to 72 hours. Remember, Inferno is a true Portland Cement and is sulphate resisting.

TRINITY PORTLAND CEMENT COMPANY

TRINITY PORTLAND · TRINITY HIGH EARLY STRENGTH · TRINITY INFERNO · TRINITY MIX · TRINITY FIBRE

DALLAS ▪ FORT WORTH ▪ HOUSTON

gauge; cut-away section of a bottom-hole sampler; and other equipment.

Representatives: The exhibit is in charge of H. B. Hill, supervising engineer of the Petroleum Division, Dallas, Texas, and G. M. Kintz, assistant district engineer, Health and Safety Branch, Bureau of Mines, Dallas, Texas. Other members of the Bureau of Mines staff who will be present are: J. J. Forbes, supervising engineer, Pittsburgh, Pennsylvania; J. B. Hynal, McAlester, Oklahoma; P. M. Hanahen, Houston, Texas; A. A. Munsch, Bartlesville, Oklahoma; Gustav Wade, Dallas, Texas, and Charles B. Carpenter, Dallas.

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GEORGE BUVINGHAUSEN
Houston, Texas

Exhibiting in Egner Brothers section.

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BYRON JACKSON COMPANY
Los Angeles, California

Booths Nos. 551 and 553

EXHIBIT: No equipment will be displayed.

Representatives: Frank Champion, vice-president, Oil-Tool Division; E. W. Upton; J. C. Miller; H. E. Grau, chief engineer and works manager of the Los Angeles factory; C. F. Vincent, Mid-Continent sales manager; R. T. Todd, Marshall Moore, and E. W. Stuart, all salesmen.

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CALMEC MANUFACTURING COMPANY, LTD.
Los Angeles, California

Booth No. 1556 (Annex)

EXHIBIT: An assortment of oil-well specialties that will include the line of Calmec valves, cement heads, chain tighteners, hardened steel pump liners for slush pumps, wire-line spoolers, tubing spiders, and one-man drill pipe spiders.

Representatives: A. S. McIntyre, vice-president and general manager, and Jos. E. Young.

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CAMERON IRON WORKS, INC.
Houston, Texas

Booths Nos. 604, 606, 705, and 707

EXHIBIT: In addition to their full line of blowout preventer equipment, both pressure and manually operated, Cameron Iron Works, Inc., will exhibit a number of new and improved tools, including several types of control heads, casingheads, tubingheads, mud valve, needle valve, expansion tube choke, casing-to-tubing packer, bottom-hole choke, and safety Christmas trees.

Representatives: Frank Quaidy, J. M. (Red) Teague, Roy N. Bean, W. B. Stevens, Sam Pattillo, F. H. Isaacks, W. Holmes Smith, O. V. Parker, Thad L. Putnam, Gene Teer, and Paul T. Putnam.

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CARBISULPHOIL COMPANY
Dallas, Texas

Booth No. 1582 (Annex)

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CARLYLE RUBBER COMPANY, INC.
New York, New York

Booth No. 1117 (Annex)

EXHIBIT: Mechanical, industrial, and oil field rubber specialties will be shown, particularly Carlyle cone-shaped packer elements for rat-hole formation testers.

Carlyle cone-shaped rat-hole formation tester packer elements are made in all sizes and tapers for replacements on all makes and types of rat-hole formation testers.

Regardless of the make of tester used, to obtain successful formation tests, the cone-shaped packer must be properly seated at the rat-hole. Carlyle cone-shaped packers are manufactured with precision tools to insure accurate tapers for positive rat-hole seating, the makers state.

Carlyle cone-shaped packer elements are constructed of properly vulcanized rubber and fabric disks (similar to rubber belting) and are finished to a smooth cone shape. A straight center hole (to size required to fit over tester mandrel) is maintained from the top to the bottom of the packer element.

Representatives: P. M. Kaminsky, president, and A. J. Kaminsky, sales manager.

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CARNEGIE-ILLINOIS STEEL CORPORATION
Pittsburgh, Pennsylvania

See exhibit of United States Steel Corporation Subsidiaries.

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CATERPILLAR TRACTOR COMPANY
Peoria, Illinois

Booths Nos. 1003, 1004, and 1005 (outside)

EXHIBIT: A complete line of Diesel oil field engines, track-type tractors, and allied equipment. Featured, among other things, will be the recently announced natural gas conversion attachment for all 125-hp. 6-cylinder "Caterpillar" Diesel engines. On exhibit also will be a water insulated exhaust manifold and special oil-field radiator, which go with this attachment. An 8-hp., air-cooled single-cylinder engine also will be shown.

Representatives: C. M. Burdette, sales manager of the central sales division; Burt Powell, news editor; W. K. Cox, assistant manager engine sales division; Reid Evans, oil field sales; Henry H. Howard, manager engine sales division; G. P. Fenn, sales department; N. E. Donnelly, manager engine sales; Ralph J. Morgan, export sales supervisor; H. G. Hartzell, engine sales division; Robert Culshaw, sales department, exhibit bureau of sales development division; Jack Gill, engine sales representative; S. C. Littlepage, engine sales division; J. N. Barnes, district representative, and J. W. Murdoch, engine sales representative. In addition, representatives of the Gulf Tractor and Equipment Company of Houston, headed by Hiram Yokum, manager, will be on hand, and representatives of Allied Equipment Manufacturers also will be present.

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CAVINS BAILER SERVICE OF TEXAS
Houston, Texas

Booths Nos. 601 and 602

EXHIBIT: Cavins hydraulic suction bailers, screen cleaners and washers, perforation washers, and fishing equipment.

Representatives: The Houston district will be represented by Thomas I. Sharp, William Strecker, D. H. Blair, Wilber A. Maxwell, W. E. Calhoon, and Jack Lloyd; the Kilgore district by Herbert L. Waters; the Shreveport, Louisiana, district by J. B. Tucker, and the Lake Charles, Louisiana, district by Ralph New.

●

CHAIN BELT COMPANY
Milwaukee, Wisconsin

Booths Nos. 515 and 517

EXHIBIT: Display will include rotary drilling chains, Rex Deepwell A.P.I. No. 3, 60,000 lb. ultimate strength; Rex Deepwell A.P.I. No. 4, 130,000 lb. ultimate strength; Rex Champion A.P.I. No. 3, 75,000 lb. ultimate strength; Rex Champion A.P.I. No. 4, 170,000 lb. ultimate strength, and Rex Universal Chain, 115,000 lb. ultimate strength.

New Drive Chains for drilling and pumping equipment: No. 3120 Rex Roller Chain, 32,500 lb. ultimate strength; No. 3140 Rex Roller Chain, 45,000 lb. ultimate strength; No. 3160 Rex Roller Chain, 55,000 lb. ultimate strength; No. D-3120 Rex Roller Chain, 65,000 lb. ultimate strength; No. D-3140 Rex Roller Chain, 90,000 lb. ultimate strength; No. D-3160 Rex Roller Chain, 110,000 lb. ultimate strength; No. E-3120 Rex Roller Chain, 97,500 lb. ultimate strength; No. E-3140 Rex Roller Chain, 135,000 lb. ultimate strength, and No. E-3160 Rex Roller Chain, 165,000 lb. ultimate strength.

For the first time these chains are offered with the advantages of offset sidebar construction.

A pictorial display of conveying equipment and construction machinery will be made.

Representatives: Brinton Welser, vice-president, Russell G. Davis, J. Walter Snavely, and W. A. Pitts.

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CHAPLIN-FULTON MANUFACTURING COMPANY
Pittsburgh, Pennsylvania

Exhibiting with Westcott and Greis, Inc.

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CHEVROLET MOTOR DIVISION
General Motors Sales Corporation
Houston, Texas

Booth No. 1014 (outside)

EXHIBIT: Several conventional model trucks, and one or two COE trucks. These trucks will be equipped with special units applicable to the oil industry.

Representatives: J. L. Drobac, E. J. Pennington, and H. K. Poffenberger.

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CHIKSAN OIL TOOL CORPORATION INC.
Fullerton, California

Exhibiting in Gulf Engineers, Inc., section.

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CHRYSLER CORPORATION ENGINE DIVISION
Detroit, Michigan

Exhibiting in C. B. Delhomme section.

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CLARK BROS. COMPANY
Olean, New York

Booths Nos. 1128 and 1130 (Annex)

EXHIBIT: Will display equipment typical of their complete line of oil-field and plant engines and compressors.

Representatives: C. P. Clark, president; J. B. O'Connor, vice-president and sales manager; D. K. Hutchcraft, Mid-Continent sales manager; F. H. Hayes, district manager, Houston territory; and W. A. Roever, salesman.

●

HARRY E. CLARK
Houston, Texas

Booths Nos. 1243 and 1245 (Annex)

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CLAYTON MARK AND COMPANY
Evanston, Illinois

Exhibiting in Continental Supply Company section.

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CLIMAX ENGINEERING COMPANY
Chicago, Illinois

Exhibiting in Continental Supply Company section.

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CLIMAX MOLYBDENUM COMPANY
New York, New York

Booth No. 1129

EXHIBIT: Booth will be used for reception space. The background will have a drawing of a derrick, showing the various pieces of equipment made from molybdenum steels.

Representatives: R. L. Wilson, P. M. Snyder, J. E. Wilson, and H. E. Hostetter.

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COAST OILFIELD SUPPLIES COMPANY
Los Angeles, California

Exhibiting in W-K-M Company section.

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THE COE MANUFACTURING COMPANY
Painesville, Ohio

Booth No. 1323 (Annex)

EXHIBIT: Miniature steam heating plant consisting of electrically heated boiler, unit heaters, glass front demonstration Drainator, electric condensate pump, and automatic level control in boiler.

Representatives: C. W. St. Clair, Paines-

ville, Ohio, and Frank M. Esch, Houston, Texas.

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COFFING HOIST COMPANY
Danville, Illinois

Exhibiting with Norvell-Wilder Supply Company.

EXHIBIT: A complete line of Safety-Pull ratchet lever hoists, the Power Master gravity lowering hoist, the Model "C" spur gear chain hoist, and the new Quik-Lift electric hoist.

Representatives: J. R. Coffing, general sales manager, and Ray Doan, district sales manager.

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COMBS-FORETICH OIL AND WATER SEPARATOR COMPANY
Conroe, Texas

Booth No. 1008-B (outside)

EXHIBIT: The company's oil and water separator will be displayed.

Representatives: Chester A. Combs and J. C. Foretich.

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COMMERCIAL IRON WORKS
Los Angeles, California

Exhibiting with Maintenance Engineering Corporation.

EXHIBIT: Complete line of orifice fittings used in connection with orifice measurement to facilitate the inspection and changing of orifice plates in the active flow line conveying gas, water, steam, and other fluids.

Representative: Oliver W. Muff.

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CONTINENTAL CHEMICAL COMPANY
Sand Springs, Oklahoma

Exhibiting in W-K-M Company section.

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CONTINENTAL MOTORS CORPORATION
Detroit, Michigan

Booth No. 1017-A (outside)

EXHIBIT: Engines, power units, and generating units will be on display. Some of these units will be in operation. A large neon sign identifying the booth will be operated from a 5-kw. generator driven by a Continental power unit. The Guiberson Company will have on display in this booth a pump of their manufacture driven by a Continental power unit. The popular Tiny Tim portable generating plant for light duties will also be on display.

Representatives: Fred T. Gould, manager of the Continental Sales and Service Company, Dallas, Texas, a subsidiary of Continental Motors Corporation, will be in charge. In attendance will be B. F. Tobin, Jr., vice-president in charge of sales for Continental Motors Corporation, and Joseph Gaia, sales representative.

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THE CONTINENTAL SUPPLY COMPANY
Dallas, Texas

Booths Nos. 328, 330, 332, 334, 336, 338, 340, 429, 431, 433, 435, 437, 439, and 441

EXHIBIT: Occupying a chain of booths between aisles 3 and 4, The Continental Supply Company and affiliated manufacturers will exhibit a wide variety of drilling and production equipment.

Features of special interest in the Continental exhibit will be the auxiliary steam engine drive display in collaboration with the Emsco Derrick and Equipment Company and Gardner-Denver Company. Continental's parent organization, The Youngstown Sheet and Tube Company, will feature a working replica of the new seamless tube mill at Youngstown, Ohio. Detailed descriptions of these displays and the other equipment exhibited by Continental's associated companies are listed below under the name of each manufacturer.

Representatives: W. J. Morris, president; F. M. Mayer, vice-president and treasurer; F. I. Brinegar, vice-president; W. G. Fitzpatrick, manager of sales; N. A. Endicott, assistant manager of sales; A. J. Olson, chief engineer; J. C. Slonneger, assistant chief engineer; J. A. Mussler, manager tubular sales; C. W. King, manager pipe department; H. E. Spencer, director of purchases; F. H. Thrailkill, district manager, Houston; E. N. Wood, district manager, Shreveport; C. N. Swanson, district manager, Tulsa; R. A. Brewer, district manager, Fort Worth; R. L. Collier, assistant district manager, Corpus Christi; J. H. Berry, assistant district manager, Wichita Falls; Wm. D. Craig, assistant district manager, Longview; F. J. Lafitte, district machinery sales representative, and R. E. F. Schmid, manager of exposition.

BRODERICK AND BASCOM ROPE COMPANY
St. Louis, Missouri

EXHIBIT: A miniature wire rope machine demonstrating the complicated procedure of wire rope manufacture will be exhibited. Samples of virtually all Broderick and Bascom oil industry wire rope will be shown, including drag lines, sand lines, rod lines, and winch lines. Factory methods will be explained.

Representatives: D. Larkin, general manager; Fred Zimmerman, sales manager; M. R. Gayle, Mid-Continent sales manager; Geo. T. Born, assistant sales manager; D. E. Dickey, research engineer, and R. A. Hill, Houston manager.

CLAYTON MARK AND COMPANY
Chicago, Illinois

EXHIBIT: A new Handlebar Check Union will be of much interest to operating men. Exhibited in actual operation at a number of different positions, it will be shown that the satisfactory operation is not affected by position. Cut-away views will show how positive sealing and full flow is accomplished. The forerunner of this union, the well-known Handlebar Union, will also be exhibited in various stages of manufacture.

Representatives: Ora Cox, sales manager, and T. Bruce Cox, field representative.

CLIMAX ENGINEERING COMPANY
Clinton, Iowa

EXHIBIT: Visitors interested in production will take unusual interest in the Climax H-4-B Blue Streak engine designed expressly for oil-well pumping service. Equipped with extra-heavy flywheels, the engine provides a remarkably smooth pumping cycle, the makers assert. Box base construction provides a large oil sump as well as structural stability. An oil-field type governor, numerous safety devices, and a running-type oil gauge are other features of interest.

Representatives: E. F. Deacon, president, and T. L. Keeling, Mid-Continent sales manager.

D + B PUMP AND SUPPLY COMPANY
Los Angeles, California

EXHIBIT: A moving exhibit showing numerous D + B pumps with cut-away parts will be featured. This company makes a specialty of producing pumping equipment to meet difficult situations. Various types of D + B pumps to overcome unusual problems will be exhibited and explained. In addition, a general line of pumping equipment, including both surface and subsurface accessories, will be shown. D + B is known for the alloy steel used in manufacturing this equipment. A.P.I. standards are rigidly adhered to so that parts will be completely interchangeable.

Representatives: E. E. Stevenson, general manager; R. H. Soll, metallurgist, and L. C. Scott, Mid-Continent manager of sales.

EMSCO DERRICK AND EQUIPMENT COMPANY
Los Angeles, California

EXHIBIT: Exhibited in connection with a Gardner-Denver 9½ by 8 vertical steam engine, the Emsco Auxiliary Steam Engine Drive will be shown in operation, the engine being actuated by a small electric motor.

The unit normally consists of a 14 by 14 Gardner-Denver horizontal steam engine, and is ordinarily used for drawworks engine, but in addition the Gardner-Denver 9½ by 8 vertical steam engine is provided as auxiliary prime mover. It is used principally to drive the rotary table; however, by means of the Emsco Auxiliary Drive, extremely flexible operation can be obtained, the makers state. It is possible to "drill-up" while the rotary machine is in operation. Either engine can operate the drawworks or rotary machine in emergencies, a safety feature much appreciated in deep-drilling operation.

Also in connection with the auxiliary drive will be exhibited the newly designed Emsco KS-27½ rotary machine. Fully enclosed and of fabriform construction, the table features flood lubrication and spiral bevel gears. The main bearing is preloaded, preventing hammering of the races when the table is run under light loads. A patented design is included that allows the drill stem bushings to be driven directly by the table, eliminating the practice of driving the drill stem bushing through the master bushing.

Representatives: G. W. Walton, vice-president and Mid-Continent machinery manager; S. W. Webster, Mid-Continent sales and service manager, and L. W. Stahl, chief engineer, Houston plant.

FAIRBANKS, MORSE AND COMPANY
Beloit, Wisconsin

EXHIBIT: The F-M 15-hp. Type "Z" engine will be exhibited in its new role as an oil-well pumping engine. Now adapted for pumping service, it has extra-heavy flywheels, force-feed lubrication, and is totally enclosed. A radiator is optional equipment, and provides ample cooling for 24-hr. operation. Other features of the engine are a V-belt-driven circulating pump, exhaust silencer, and a Type "J" clutch.

Representatives: H. J. Renken, manager, Oil Field Division; F. D. Ratcliffe, representative; H. D. Gobble, representative, and F. P. Grutzner, assistant chief engineer.

THE FALK CORPORATION
Milwaukee, Wisconsin

EXHIBIT: Occupying a prominent spot in the Continental exhibit will be a Falk 70CD Gear Unit, representing a complete line of double-reduction gears for oil-well pumping. In addition there will be on display several speed reducers and motor reducers as applied in oil industry service.

Herringbone gears as used in the 70CD Oil-Well Pumping Unit were pioneered by Falk and cut on special machines designed and used exclusively by Falk, the makers assert. Double-end high- and low-speed shafts afford the advantage of assembling the brake or pulley on either side of the high-speed shaft.

The Falk Trough System of lubrication insures a clean supply of lubricant to all bearings, and special oil retainers prevent any leakage of oil and form an effective seal against the admission of dirt, it is stated.

Ratio of the 70CD Unit is 30.4:1, and the peak torque capacity is 140 000 in-lb.

Representatives: W. P. Schmitter, chief engineer; W. L. Schneider, assistant sales manager, and T. F. Scannell, district manager, Oil Field Division.

FARRAR AND TREFTS, INC.
Buffalo, New York

EXHIBIT: Photographs of Farrar and Trefts oil-country boilers will be exhibited, and features of interest will be explained. Farrar and Trefts will also have an exhibit in Booth No. 1022 (outside) where a new all-welded "high-power" oil-country boiler will be on display. The all-welded boiler features lighter weight, easier washing and cleaning, elimination of riveted joints, and low maintenance cost. A streamlined effect is obtained by the elimination of riveted joints.

Representatives: John C. Trefts, president, and S. Mensonides, vice-president.

GARDNER-DENVER COMPANY
Quincy, Illinois

EXHIBIT: In connection with the Emsco Auxiliary Drive, Gardner-Denver will exhibit the 9½ by 8 Vertical Steam Engine. This engine gives unusual steam economy for rotating by use of a variable cutoff, the makers state. Sturdy and strong, it is capable of sustained high speeds, and suitable to handle the long strings of today's deep-drilling service, it is asserted.

In addition to use with the auxiliary drive, the vertical engine is recommended for driving power slush pump and for independently serving as a prime mover for the rotary machine.

Representatives: E. F. Schaefer, vice-president; R. J. MacFarland, sales manager, and R. J. Bauer, representative.

THE MECHANICAL RUBBER COMPANY
Passaic, New Jersey

EXHIBIT: Belting, hose, and packing especially manufactured for oil country use will be displayed by The Mechanical Rubber Company. The company manufactures a specific type of packing, and a specific type of hose for every oil industry use. Samples will be exhibited on a large display board, and features explained by representatives.

Representatives: B. F. Ruether, president; W. E. Belcher, district sales manager; A. M. Langley, representative, and B. F. Franklin, representative.

NEW BEDFORD CORDAGE COMPANY
New York, New York

EXHIBIT: Since 1912, when Continental first entered the supply business, New Bedford Cordage Company has distributed its products to the oil industry exclusively through The Continental Supply Company. New Bedford Cordage Company has been in the business of producing quality cordage for more than 100 years. Samples of the highest grade selected manila fiber, chosen from the hemp markets of the world, will be featured by this concern at the show. Spinning lines, cat lines, drilling cables, and pull rods will be on display.

Representatives: George W. Haywood, vice-president, and H. W. Davis, sales manager.

WESTCOTT VALVE COMPANY
East St. Louis, Illinois

EXHIBIT: Sectionalized models of Westcott Valves reproduced in miniature will be a feature of the Westcott exhibit. A Christmas tree made completely of aluminum and produced in the Westcott foundry and shops will also be on display. All working parts will be fully exposed by the cut-away section, and representatives will be on hand to explain the detailed mechanisms.

Representatives: A. V. Wadsworth, executive vice-president; L. L. Scharf, assistant treasurer; W. C. Wadsworth, manager, Tulsa, and H. H. Tinch, manager, Houston.

THE YOUNGSTOWN SHEET AND TUBE COMPANY
Youngstown, Ohio

EXHIBIT: A working model of the Youngstown Sheet and Tube Company's new seamless mill will show in detail the manufacture of seamless pipe. Beginning with piercing of the billet, the model shows the various steps of manufacture to the completion of the finished tube.

The miniature mill will be operated by assistants who will explain factory methods.

Representatives: C. H. Longfield, general manager sales; M. S. Curtis, sales promotion manager; E. P. Corey, general manager tubular goods sales; J. C. Siegle, general superintendent Tubular Goods Division; A. A. Chambers, metallurgist; G. W. Christopher, assistant manager tubular goods sales; Harvey L. Miller, special representative in charge oil country tubular sales; J. M. Jackson, district sales manager, Houston; L. E. Battin, salesman, Houston; George V. James, Youngstown, and Ed. Hendricks, Youngstown.

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FRED E. COOPER
Tulsa, Oklahoma

Booths Nos. 1035, 1037, and 1064 (outside)

EXHIBIT: Representative line of the various models of the following will be displayed:

(a) Allis-Chalmers heavy-duty, tractor-type hoisting equipment.

(b) Allis-Chalmers heavy-duty, skid-type hoisting equipment and light drilling units.

(c) Complete line of Allis-Chalmers heavy-duty, slow-speed power engines.

(d) Three models of well-servicing equipment.

(e) Allis-Chalmers Model UEL skid winch.

(f) Allis-Chalmers Model L tractor.

Representatives: Fred E. Cooper, Tulsa, Oklahoma; A. G. Bailey, Tulsa; J. W. Allen, Tulsa; W. H. Allen, Tulsa; Louis Gasche, Tulsa; H. B. Bloxom, Tulsa; C. F. Nelson, Longview, Texas; W. E. Goranflo, Longview; Jack Fincham, Longview; John Flanagan, Longview; Downs Blackburn, Lake Charles, Louisiana; O. J. Work, Beeville, Texas, and W. C. Simpson, Odessa, Texas.

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THE COOPER-BESSEMER CORPORATION
Mt. Vernon, Ohio

Booth No. 1529 (Annex)

EXHIBIT: Type G-SC vertical pumping engine, designed primarily for oil-field pumping and drilling service, will be displayed.

Representatives: R. H. Dale, Houston, and A. A. Burrell, Dallas.

•

COORS PORCELAIN COMPANY
Golden, Colorado

Exhibiting with W. H. Curtin and Company.

•

COPELAND ELECTRIC COMPANY
Houston, Texas

Booth: Balcony Coliseum

•

COPPUS ENGINEERING CORPORATION
Worcester, Massachusetts

Booths Nos. 1146 and 1148

EXHIBIT: Coppus-Dennis Fanmix gas burner, the Coppus Blue-Ribbon steam turbine for direct drive, the Coppus Blue-Ribbon steam turbine having built-in speed reducer, Coppus Heat Killer, Coppus Tank Ventilator, Coppus Air Filter for Diesel engines or compressors, and Coppus Air Filter for ventilating systems.

Representatives: Edwin L. Dennis, M. van Stappen, R. W. Bier, and Garrett Phillips.

•

CORE DRILLING COMPANY, INC.
Houston, Texas

Booth No. 1542 (Annex)

EXHIBIT: Various types of cores recovered throughout the country, field pictures, etc., from some of the difficult jobs that we have been on will be shown.

Representative: H. H. King, vice-president, will be in charge of the booth.

•

CORNING GLASS WORKS
Corning, New York

Exhibiting with W. H. Curtin and Company.

•

C-O-TWO FIRE EQUIPMENT COMPANY
Newark, New Jersey

Booth No. 501

EXHIBIT: Will feature Underwriters' Laboratories approved automatic carbon dioxide fire extinguishing system operating on both the "fixed temperature" and "rate of rise" principles. The "Fire Eye", a combination fire detector, makes this possible and guarantees quick detection of either the explosion or fast-burning fire or the slow-spreading fire. The system may also be operated manually.

Another featured item to be exhibited will be the baffle-type discharge nozzle that eliminates a non-turbulent distribution of gas from C-O-Two carbon dioxide extinguishing systems. These new nozzles reduce the velocity and pressure of the discharge and permit rapid expansion and non-violent penetration of the gas throughout the entire protected area. They are compact and do not require a protruding horn or metal enclosure that might become damaged or knocked off.

Representatives: J. P. Maloney, general field sales manager; W. L. Ferrier, Chicago district manager; B. S. Allen, Dan Butler, and B. F. Covington, sales representatives.

•

CRANE CO.
Chicago, Illinois

Booths Nos. 745, 747, 749, and 751

EXHIBIT: A complete line of valves and fittings as used in the oil industry will be displayed. These valves will be in sizes ⅛ in. to 8 in. A small display showing various types of welding as performed in the Crane shops also will be given space in the booth setup.

Crane forged-steel socket welding fittings, designed for small-diameter welded lines have just been introduced by the company. These will be shown.

Representatives: P. R. Mork, vice-president in charge of sales; T. R. Taylor, district manager; C. E. Johnson, Houston branch; R. A. Hendrickson, manager, oil sales; W. H. Pape, manager, valve and fitting sales; B. E. Foster; E. V. Parker, Houston branch office; T. M. Lowe, display and exhibit department; F. Bobbitt, H. W. Morgan, E. Howell, and W. Laade.

•

CRANE PACKING COMPANY
Chicago, Illinois

Booth No. 1118 (Annex)

EXHIBIT: Packing materials especially designed for the various services of the petroleum industry.

Representatives: E. B. Heathcott, R. W. Overton, M. F. Blackbird, F. E. Payne, president, and Roy Blackbird.

•

CROSBY STEAM GAGE AND VALVE COMPANY
Boston, Massachusetts

Exhibiting with W. H. Curtin and Company.

•

CROWN SPRAY GUN MANUFACTURING COMPANY
Los Angeles, California

Exhibiting in Egner Brothers section.

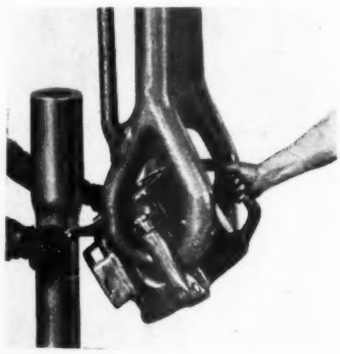
•

CRUTCHER-ROLFS-CUMMINGS, INC.
Houston, Texas

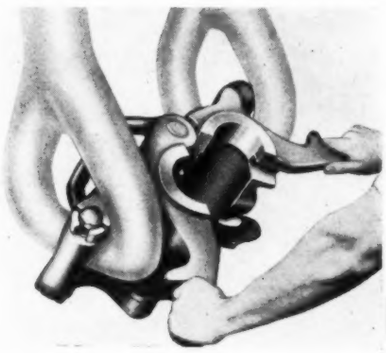
Exhibiting in W-K-M Company and Air-Reduction Sales Company sections.

SEE ALL 3

See the BJ-Type G—ELEVATOR for handling external upset drill pipe, tubing or casing, without using lifting plugs. The fully heat treated body is made in two interlocking halves securely latched together, and no strain is imposed upon the latch pin. The rear handle (shown below) aids in fast, safe handling.



See how safe and sturdy a modern heavy duty elevator really is! The BJ — Type A — ELEVATOR has a fully heat treated body which insures long life. See the well designed guarded operating handles —the latch that is protected from accidental opening when "tailing in" — the link retainers that are permanently attached. It has a rear handle (see below) and grease gun connection for easy lubrication.

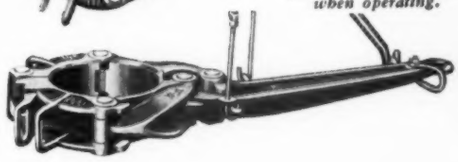


See how BJ makes a tong strong enough for breaking out drill collars, core barrels and reamer subs—yet handy enough for fast handling of casing. See the large operating handles, the loop-handle latch which keeps fingers out of danger, and the lubricated hinge pins which work easier and last longer. See why this modern tong should be on every rig —one look will convince you.

See Your 1938 Composite Catalog or write for the BJ Catalog

See how easy you change from "make-up" to "break-out" position by unhooking one rod rolling the tong over and re-hooking in the same eye.

See how the man-size handles are properly placed to avoid danger when operating.



BJ Drilling TOOLS

BYRON JACKSON CO.

Houston • LOS ANGELES • New York

CUMMINS ENGINE COMPANY
Columbus, Indiana

See exhibit of Mid-Continent Supply Company.

CUNNINGHAM MACHINE AND SUPPLY COMPANY
Houston, Texas

Exhibiting in the Houston Slush Pump Repair Company section.

W. H. CURTIN AND COMPANY, INC.
Houston, Texas

Booths Nos. 358, 360, 459, and 461

EXHIBIT: Automatic pH indicator and recorder, front view Ful-Kontrol petroleum distillation apparatus, grease channel tester for rear-axle lubricants, new smoke tendency lamp for determinations on all grades of kerosene, industrial viscometer, indicating and recording pressure gauges, manometers, heavy-duty hand centrifuges, electric centrifuges, safety and relief valves, Chainomatic analytical balances, analyzed chemicals, color slide projector, Pyrex glassware, Exax Blue Line glassware, porcelain laboratory ware, combustion testing equipment, indicating and recording potentiometers, and numerous improved oil-testing equipment.

Representatives: W. H. Curtin, president; B. A. McEnnis, vice-president; K. H. Clough; M. A. Smith; J. A. Muller, and B. B. Manuel.

CURTIS PNEUMATIC MACHINERY COMPANY
St. Louis, Missouri

Exhibiting in Mid-Continent Supply Company section.

CYCLONE FENCE COMPANY
Waukegan, Illinois

Exhibiting in United States Steel Corporation section.

M. N. DANNENBAUM COMPANY
Houston, Texas

Booths Nos. 518, 520, 619, and 621

EXHIBIT: Equipment of the following manufacturers will be displayed: Barco Manufacturing Company, Fisher Governor Company, Peerless Pump Company, Sivyer Steel Casting Company, and Yarnall-Waring Company.

Representative: M. N. Dannenbaum.

DARLING VALVE AND MANUFACTURING COMPANY
Williamsport, Pennsylvania

Booths Nos. 351 and 353

EXHIBIT: Equipment on display will include the following: Darling all-bronze gate valves; Darling special alloy gate valves; Darling pipe-line and flow-line gate valves; Darling forged-steel drilling-through and flow-line gate valves; Darling semi-steel pipe-line, flow-line, and gathering-line gate valves; Darling cast-steel gate valves for use on refinery and high-pressure power piping; Darling fire hydrants; Darling balls and seats, and the Darcova, Darval, and Darflex valve cups.

Representatives: J. S. Kiesel, chief engineer, and M. L. Hough, vice-president and treasurer.

DAVIS REGULATOR COMPANY
Chicago, Illinois

Booths Nos. 726 and 728

EXHIBIT: Display will be in conjunction with that of Westcott and Greis, Inc. The exhibit will include automatic valve specialties and liquid level controllers of interest to the producers and refiners of petroleum products.

The recently redesigned line of Davis gas back-pressure valves and supersensitive relief valves will be a feature. A new line of spring-loaded gas back-pressure valves will be shown. Other products include the packless float box having indicating signals and pilot valve for remote control, lever-operated valves, pressure regulators, diaphragm motor valves, and strainers.

Representatives: In attendance from the Davis Regulator Company will be George C. Davis, president, and Messrs. Hachmeister and Peterson.

THE DAYTON RUBBER MANUFACTURING COMPANY
Dayton, Ohio

Booths Nos. 1510 and 1512 (Annex)

EXHIBIT: On display will be the new Dayton Cog-Belt Drive. This new Dayton Cog-Belt has greater life and efficiency, and requires less adjustment owing to the fact that Daytex Cord has greater tensile strength, less stretch, and greater resistance to heat, according to the manufacturer.

Representatives: K. H. Glanton, vice-president in charge of mechanical sales; T. C. Davis, sales manager, industrial division; E. P. Spore, district sales manager; L. K. Sherman, district representative, and R. H. Hohman, district representative.

D & B PUMP AND SUPPLY COMPANY
Los Angeles, California

Exhibiting in Continental Supply Company section.

DE LUXE PRODUCTS CORPORATION
La Porte, Indiana

Exhibiting in Transportation Equipment Company section.

THOS. DEVLIN MANUFACTURING COMPANY
Burlington, New Jersey

Exhibiting with J. E. Bobo.

DE WALT PRODUCTS COMPANY
Lancaster, Pennsylvania

Exhibiting in Egner Brothers section.

DIAMOND CHAIN AND MANUFACTURING COMPANY
Indianapolis, Indiana

Booths Nos. 1138 and 1140 (Annex)

EXHIBIT: Complete display of roller chains as used on pumping units and for drilling and servicing equipment, and sprockets with which these chains operate; also several sizes of the improved double chain type flexible shaft coupling. Enlarged photographs of actual applications will be on exhibit together with a large map of the United States showing localized stocks as carried by our distributors throughout the southwest.

Representatives: J. L. Wamsley, W. A. Warrick, and H. L. Martin.

DIESEL ENGINE AND ELECTRIC COMPANY
San Antonio, Texas

Exhibiting in Witte Engine Works section.

DIXON VALVE AND COUPLING COMPANY
Philadelphia, Pennsylvania

Exhibiting with J. E. Bobo.

DODGE MANUFACTURING CORPORATION
Mishawaka, Indiana

Booths Nos. 1501 and 1503 (Annex)

EXHIBIT: Display will consist of power transmission appliances for oil-field equipment, including Dodge-Timken bearing pillow blocks, Diamond D clutches, Dodge V-belt sheaves, and Dodge V-belts.

DOUBLE SEAL RING COMPANY
Fort Worth, Texas

Booth No. 230

EXHIBIT: Full line of piston rings will be displayed.

Representatives: Wm. S. Baker, F. J. Welu, A. R. Clark, and M. L. Munday.

DOWELL INCORPORATED
Midland, Michigan

Booths Nos. 151 and 153

EXHIBIT: The following will be demonstrated:

(a) Oil and gas well acidizing service.

(b) Uses and application of Dowell solvents for removal of paraffin accumulations from tubing, lead, or flow lines, and tanks.

(c) Formation plugging, a chemical material for control of unwanted water or gas flows encountered during drilling or deepening of wells.

(d) Dowmetal casing and other accessories. A new magnesium alloy pipe that may be run in oil wells and later removed with inhibited hydrochloric acid.

Representatives: F. I. McConnell, assistant sales manager, Fort Worth, and J. L. Coss, sales engineer, Tulsa, will be in charge of exhibit. These men will be assisted by various members of the sales staff and general office, as well as several representatives from the Dow Chemical Company, the parent company.

DRESSER MANUFACTURING COMPANY
Bradford, Pennsylvania

Booths Nos. 1128, 1130, and 1403 (Annex)

EXHIBIT: A complete exhibit of Dresser pipe couplings and repair devices for the construction and maintenance of pipe lines. Included will be Dresser steel couplings, fittings, repair clamps, and repair sleeves. An interesting feature of the exhibit will be an actual demonstration of a flexible pipe joint. A pipe line will be maintained at a pressure of 100 lb. per sq. in. and a joint on this line will be moved up and down through a 4° arc by an eccentric. A counter will keep track of the number of deflections, which on previous exhibits have run as high as 625,621 before the show closed. This is called the pipe joint that "lives and breathes."

Representatives: H. P. Boncher, sales manager; C. T. Davis, district manager, and H. R. Shidel, district manager, Oil-field Division.

THE DUFF-NORTON MANUFACTURING COMPANY
Pittsburgh, Pennsylvania

Booths Nos. 719 and 721

EXHIBIT: Displaying lifting jacks of all types for every requirement.

Representatives: C. N. Thulin, Albert Roberts, and H. C. Gardner.

E. I. DU PONT DE NEMOURS AND COMPANY, INC.
Wilmington, Delaware

Booths Nos. 1124 and 1126 (Annex)

EXHIBIT: Will have on display a diarama showing a working oil well. The various places where neoprene products are used will be indicated with arrows. Will also have a tri-plane display showing pictures of various neoprene products used in oil marketing. On exhibit also will be various neoprene oil field products, as well as a machine for demonstrating the ability of neoprene to resist abrasion under oily conditions and under ordinary conditions.

Representatives: V. A. Cosler, sales manager; A. F. Clark, advertising manager, and H. L. Lawrence, applications engineer.

GIL V. DYE COMPANY
Houston, Texas

Booths Nos. 1502, 1504, and 1506 (Annex)

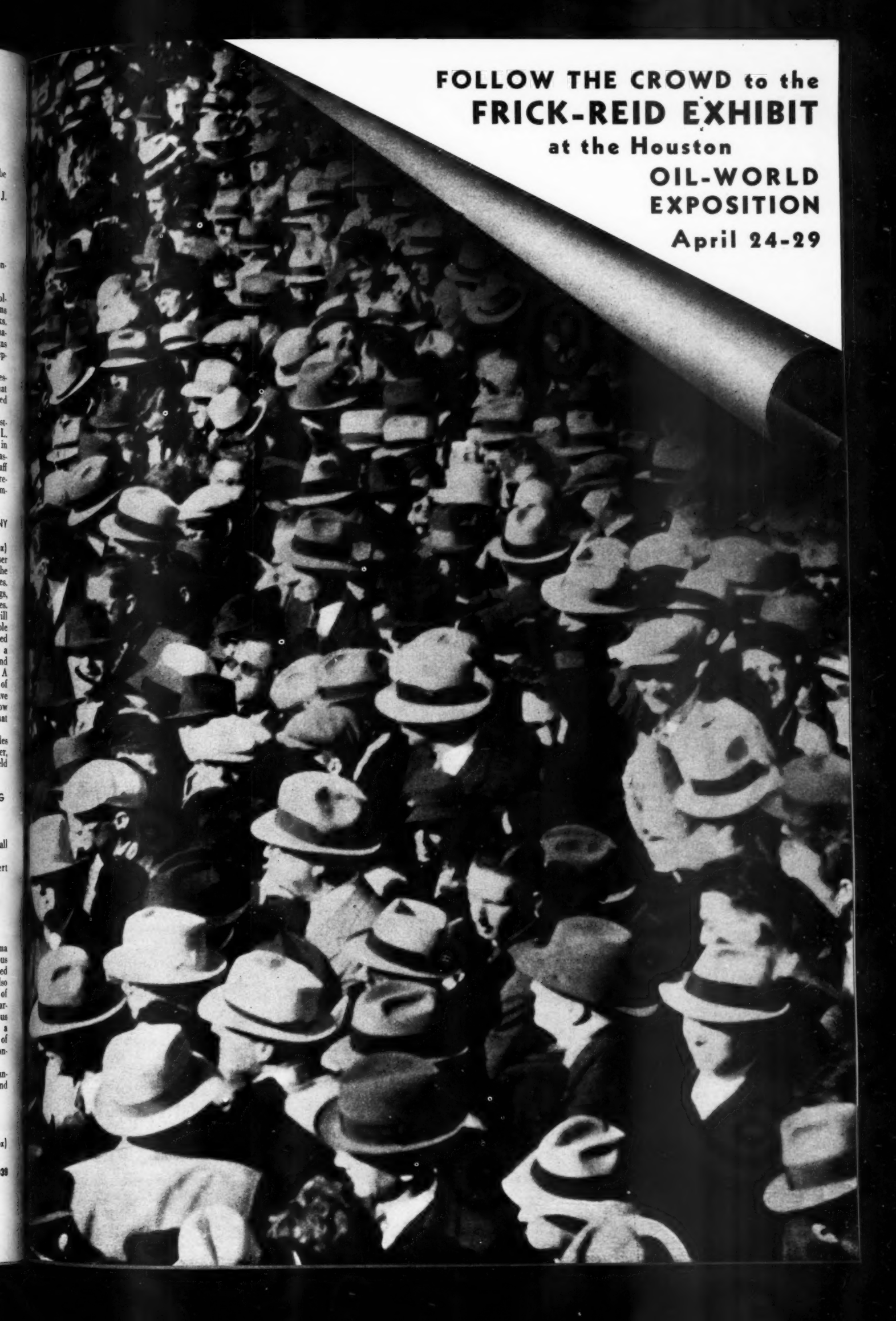

FOLLOW THE CROWD to the
FRICK-REID EXHIBIT
at the Houston
OIL-WORLD
EXPOSITION
April 24-29

EXHIBIT: Automatic welding head and welding electrodes of Una Welding, Inc., Cleveland, Ohio. Welding machines of Hobart Brothers Company, Troy, Ohio. Welding alloys of Arcos Corporation, Philadelphia, Pennsylvania.

Representatives: W. B. Baker, vice-president and general manager, Una Welding, Inc., Cleveland Ohio, and Gil V. Dye, manager, Unaweld Manufacturing Company of Texas, and Gil V. Dye Company, Houston, Texas.

●

EASTMAN OIL WELL SURVEY COMPANY
EASTMAN MANUFACTURING COMPANY
Dallas, Texas

Booths Nos. 318, 320, 419, and 421

EXHIBIT: Equipment displayed will be surveying instruments for multiple shot continuous surveying, single shot instruments, drift recording instruments; a complete line of whipstocks, removable whipstocks for open-hole and directional-drilling work, casing whipstocks for milling-out of casing, and open-hole permanent whipstocks; also casing rollers for use in rolling out collapsed pipe.

Representatives: H. John Eastman, president; Ray F. Bolton, vice-president, Texas; Ross E. Wiley, vice-president, California; C. P. Collins, Houston division manager; M. E. Shrader, Oklahoma division manager; Albert G. Pabst; Lee Fields; L. C. Miller; Norman Oswald; Clyde Stokenbury, and J. Benton Murdoch, Jr.

●

THE EDWARD VALVE AND MANUFACTURING CO., INC.
East Chicago, Indiana

Booths Nos. 708, 710, and 712

EXHIBIT: Cast and forged-steel valves for refinery, pipe line, and producing divisions of the petroleum industry.

Representatives: W. W. Crawford, president; J. E. McDonald, sales manager; W. W. Mohr, chief engineer, and W. F. Crawford, vice-president.

●

EGNER BROTHERS
Houston, Texas

Booths Nos. 151 and 196 (Annex)

EXHIBIT: The Gordon Smith Air Compressor Unit will be one of the machines displayed. This unit is used in connection with sand blasting, spray painting, operation of pneumatic tools, jetting of water wells, etc. Other machines that will be on display and under actual demonstration are: DeWalt combination woodworker, several models of the Schramm portable and stationary air compressors, all types of spray equipment, Wallace No. 1 radial saw, pneumatic tools, sand blast machines, light and high displacement gasoline-driven air compressor units designed for spray painting, manufactured by P. K. Lindsay and Company, and other electric hand saws, drills, etc.

Representatives: P. O. Egner, Pat O'Reilly, Ed Magnuson, and N. H. McClamroch, all of Egner Brothers, Houston, Texas; H. W. Wharton, Schramm, Inc., West Chester, Pennsylvania; Paul Gardner, president, DeWalt Products Corporation, Lancaster, Pennsylvania; George Buvinghausen, Houston, spray painting and sand blasting contractor.

●

EMEROL MANUFACTURING COMPANY
New York, New York

Booths Nos. 1520 and 1522 (Annex)

EXHIBIT: Will display top-cylinder oilers for gas engines, using liquid and dry fuels, which are known as Marvel Inverse Oilers, also Marvel Mystery Oil, a top-cylinder lubricant for use with these oilers, and which is also used as an additive to regular lubricating oils. Other products are: Marvel Hi-Rev, a motor tune-up fluid and desludging compound, and Emerol Chassis Oil, a special waterproof chassis lubricant.

Representatives: B. N. Pierce, president; C. B. Pierce, production manager; S. W. McCandless, sales manager; H. H. Whelan, resident Texas representative; Roy L. Stroud, sales representative, and Mr. Crowel, sales representative.

●

EMSCO DERRICK AND EQUIPMENT COMPANY
Los Angeles, California

Exhibiting in Continental Supply Company section.

●

ENSIGN CARBURETOR COMPANY, LTD.
Huntington Park, California

Booth No. 6

EXHIBIT: Complete line of Ensign natural gas, butane, and combination natural gas and gasoline, and combination butane and gasoline carburetion equipment. Will also display a complete line of Forster torches and burners for use with artificial gas, natural gas, and butane-propane mixtures. These torches are manufactured by the Ransome Company, Emeryville, California.

Representatives: P. W. Ensign, R. R. Wyker, L. C. Arter, and L. G. Smith.

●

ERIE MANUFACTURING COMPANY
Houston, Texas

Exhibiting in Maintenance Engineering Corporation section.

●

R. B. EVERETT AND COMPANY
Houston, Texas

Exhibiting in Harnischfeger Corporation section.

●

EVERLASTING VALVE COMPANY
Jersey City, New Jersey

Booth No. 1048

EXHIBIT: A complete line of Everlasting valves. Of special interest is a motor-driven demonstrating valve, which presents to view the vital features of the Everlasting Valve. Valves will be shown for pressures to 600 lb. specifications. The Everlasting Emergency Throttle Shut-off Valve demonstrates a safety feature.

Representatives: E. N. Corning and John F. String.

●

GEORGE E. FAILING SUPPLY COMPANY
Enid, Oklahoma

Booth No. 1039 (outside)

EXHIBIT: Equipment to be displayed is portable exploration and drilling rigs and equipment.

Representatives: George E. Failing, T. E. Failing, J. C. Failing, and Al Braithwaite.

●

FAIRBANKS, MORSE AND COMPANY
Chicago, Illinois

Exhibiting in Continental Supply Company section.

●

FALK CORPORATION
Milwaukee, Wisconsin

Exhibiting in Continental Supply Company section.

●

FARRAR AND TREFTS, INC.
Buffalo, New York

Booth No. 1022 (outside)
Booth No. 429 (Coliseum)

EXHIBIT: All-welded "High Power" oil-country boiler. On this boiler all riveted joints have been replaced by fusion-welded joints. Manufacturers claim the following advantages for this construction: Less maintenance expense by the elimination of riveted joints, quicker cleaning and washing because of smooth interior, lighter weight, neater appearance and streamlined effect.

Representatives: John C. Trefts, president, and S. Mensonides, vice-president.

FISHER GOVERNOR COMPANY
Marshalltown, Iowa

Booths Nos. 518, 520, 619, and 621

EXHIBIT: A new wide-range, full-throttling column liquid-level controller for refinery and field application. It is particularly advantageous for use on reboilers, accumulators, strippers, interface control, as well as high-pressure, long-range throttling applications in refinery and production work.

A complete line of diaphragm motor valves, including V-port and top and bottom guided construction inner valves; handwheel super-structures or topwork constructions.

The Fisher-King Gas Pressure Booster.

There will also be on display a sectionalized cross-section of the Philneumatic deep-well gas-lift pumping unit.

In addition, a complete line of miscellaneous items of pressure and liquid level controllers will be shown.

Representatives: P. A. Elfers, K. L. Puffer, and M. N. Dannenbaum.

●

GEORGE J. FIX COMPANY
Dallas, Texas

Booths Nos. 314 and 316 (Coliseum)
Booth No. 1556 (Annex)

EXHIBIT: Products displayed will be those manufactured by the Baldwin-Duckworth Chain Corporation, the Roller Bearing Company of America, and the Shafer Bearing Corporation. For details of equipment to be shown, as well as those who will be in attendance, see listings under those two firms.

●

FLUID PACKED PUMP COMPANY
Los Nietos, California

Booths Nos. 309 and 311

EXHIBIT: Oil-well pumps and accessories will be on display.

Representatives: Clyde Ellwood of Oklahoma, Bob Miller of Houston, Sidney Shuman of East Texas, and Frank Norris of California.

●

C. G. FORSHEY
Houston, Texas

Booths Nos. 1577, 1579, and 1581 (Annex)

EXHIBIT: Equipment of the Towmotor Company, Cleveland, Ohio, Kron Company, Bridgeport, Connecticut, and Powell Pressed Steel Company, Hubbard, Ohio, will be displayed.

●

THE FOXBORO COMPANY
Foxboro, Massachusetts

Booth No. 1222 (Annex)

EXHIBIT: Display will feature pyrometric instruments for the oil industry. This will include the newly developed Stabilog potentiometer recording controller, the key switch cabinet, and potentiometer indicator unit, single- and multiple-record potentiometer recorders, flush-mounted potentiometer controller, and a pipe-still control unit. In addition to the pyrometric instruments there will be shown the Foxboro pneumatic transmission system, cut models of a flow meter, and a Stabilflo valve.

At each end of the central gauge board there will be indirectly illuminated photo panels showing Foxboro instruments as used in the oil industry.

Representatives: G. B. Lane, manager, Dallas office; J. B. McMahon, manager, Controller Division; J. J. Burnett, manager, Chicago office; H. G. Griffith, manager, Houston office; E. L. Stark, sales engineer; C. L. Bryan, sales engineer; E. A. Thomas, sales engineer, and J. Heinzerling, sales engineer.

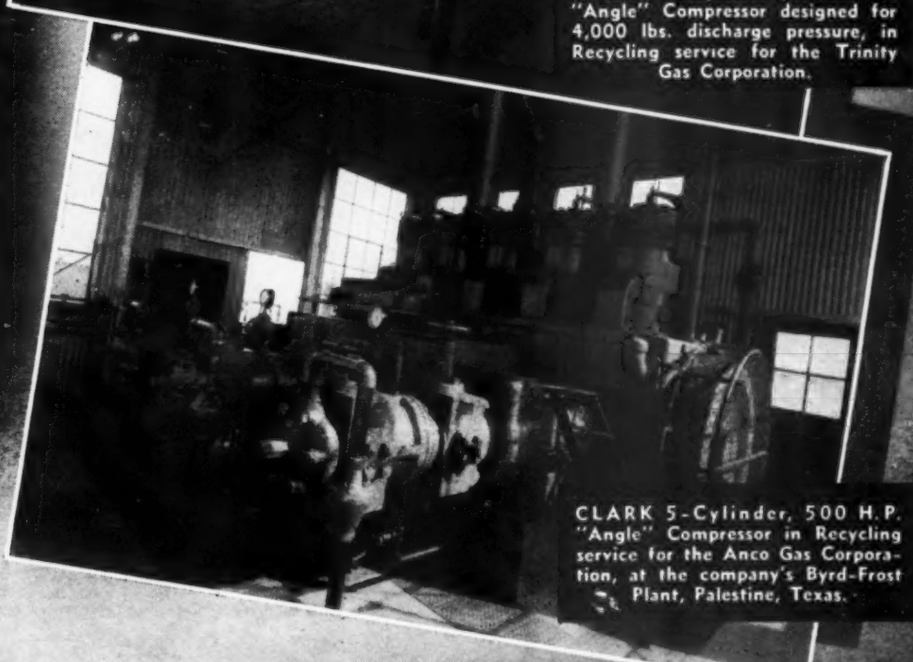
(Continued on Page 110)

LING *and* REPRESSURING

2,400 H. P. CLARK "Angle" Compressor Battery—Four 6-cylinder, 600 H.P. units arranged back to back, at new Recycling Plant of the Corpus Christi Corporation, near Corpus Christi, Texas. This battery is handling 55,000,000 cu. ft. of gas daily at 3,000 lbs. discharge pressure.

Continental Recycling and Pressure Maintenance Plant, Tepetate, La. Six 300 H.P. and two 500 H.P. CLARK "Angles" arranged back to back. In operation 2 years at 2,600 to 3,500 lbs. discharge pressures.

CLARK 6-Cylinder, 600 H.P. "Angle" Compressor designed for 4,000 lbs. discharge pressure, in Recycling service for the Trinity Gas Corporation.



CLARK 5-Cylinder, 500 H.P. "Angle" Compressor in Recycling service for the Anco Gas Corporation, at the company's Byrd-Frost Plant, Palestine, Texas.

ubstantial savings

Smaller foundations, floor space and buildings; (3) Lower fuel consumption, due to CLARK patented Super-2-Cycle Fuel Injection; (4) Extreme simplicity of Super "2" Cycle engine design, resulting in low maintenance.

The savings that have appealed to other operators will appeal to you. Investigate.

CLARK BROS. CO... Olean, N.Y., U.S.A.

Export Office: 30 Rockefeller Plaza, New York. Domestic Sales Offices and Warehouses: Tulsa, Okla., Houston, Texas, Chicago, Ill., Boston, Mass. (131 Clarendon St.) West Coast Office: Smith-Booth-Usher Co., Los Angeles, Cal. Foreign Offices: 72 Turnmill St., London, E. C. 1; 4 Str. Gen. Poetas, Bucharest, Roumania.

RK

(Continued from Page 106)

FRICK-REID SUPPLY CORPORATION
Tulsa, Oklahoma

Booths Nos. 350, 352, 354, 356, 451, 453, 455, and 457

EXHIBIT: Material manufactured by the following companies will be displayed:

Axelson Manufacturing Company.
Beaumont Iron Works Company.
Century Electric Company.
Gilmore Wire Rope Division of the Jones and Laughlin Steel Corporation.

Representatives: J. L. Shakely, president; Robert McCoy, Jr., vice-president; H. H. Wilson, sales manager; V. V. McGrew, district sales manager, and C. B. Moore, city sales manager.

•

FRUEHAUF TRAILER COMPANY, INC.
Detroit, Michigan

Booth No. 1016-A (outside)

EXHIBIT: A tank trailer and a pole trailer will be displayed.

Representative: J. W. Youngblood, manager of Dallas branch.

•

GALION ALLSTEEL BODY COMPANY
Galion, Ohio

Exhibiting with Transportation Equipment Company.

EXHIBIT: Hydraulic dump bodies will be displayed.

•

GARDNER-DENVER COMPANY
Quincy, Illinois

Exhibiting in Continental Supply Company section.

EXHIBIT: Will feature their 9½ by 8 vertical twin-cylinder steam drilling engine. The engine will be shown in actual operation driving an Emsco transmission.

The Gardner-Denver 9½ by 8 engine is suitable for driving the rotary table directly and at the same time has sufficient power to serve as a standby for driving the drawworks. The engine is also suitable for driving a mud pump by means of "V" belts, flat belt, or chain drive.

The engine is reversible and is of the adjustable cut-off type. The cut-off is adjusted manually and is easily set to meet load requirements. Steam valves are of the inside admission piston valve type. The valves are tight under high pressures and with superheated steam. Steam cylinders are insulated with mineral wool, which is covered by sheet steel. Each end of each cylinder is equipped with an automatic dump valve. All moving parts of the engine are completely enclosed against dust and dirt and are flood lubricated by means of a combination splash and pump system. The crankshaft is of forged steel. Connecting rods are of the marine type. Crossheads are of alloy cast-steel fitted top and bottom with lead bronze shoes. Piston rod stuffing boxes and oil stop heads are fitted with metallic packing.

Representatives: E. F. Schaefer, R. J. MacFarland, and R. J. Bauer.

•

THE GARLOCK PACKING COMPANY
Palmyra, New York

Booths Nos. 519 and 521

EXHIBIT: Will display a line of mechanical packings applicable to petroleum industry equipment.

Representatives: W. A. Redd, Jr., Birmingham district manager; A. C. Gustafson and C. T. Crump, local representatives.

•

GARROTT BRASS AND MACHINE COMPANY, INC.
Houston, Texas

Booths Nos. 613 and 615

EXHIBIT: Display will consist mainly of Garrott Steam Turbo-Generators, Steam Turbines, and Bug Blowers.

Representatives: Robert Collier and L. J. Wey.

•

GAR WOOD INDUSTRIES, INC.
Winch Division
Detroit, Michigan

Booths Nos. 1145 and 1147 (Annex)

EXHIBIT: The Mead-Morrison winch division of Gar Wood Industries, Inc., will exhibit a complete new line of Gar Wood oil-field winches. The display will consist of eight winch models ranging from the smallest to the largest sizes, embracing capacities to 70,000 lb. single line pull.

Representatives: G. E. Robinson, manager of the Gar Wood winch division, and B. A. Cooper, sales engineer.

•

GAS LIFT CORPORATION
Houston, Texas

Booth No. 1215 (Annex)

Also see exhibit of M. O. Johnston Oil Field Service Corporation.

•

GATES RUBBER COMPANY
Denver, Colorado

Booths Nos. 1328 and 1330 (Annex)

•

GATKE CORPORATION
Chicago, Illinois

Booth No. 700

EXHIBIT: Gatke deep-well woven brake lining, Gatke brake and friction blocks, Gatke woven and moulded clutch facings, and Gatke non-metallic bearings.

Representatives: Thomas L. Gatke, J. D. Johnson, Jr., and Lee Boswell.

•

GENERAL CHEMICAL COMPANY
New York, New York

Exhibiting in Industrial-Scientific Supply Company section.

•

GENERAL ELECTRIC COMPANY
Schenectady, New York

Booths Nos. 1532 and 1534 (Annex)

EXHIBIT: The display will include the following:

A 5-kw. constant-voltage, variable-speed generator for rig lighting and auxiliaries for Diesel drilling equipment. Also a Turbolite generator for rig lighting and auxiliaries on steam-drilling rigs.

Weather-proof motors and control for well pumping.

Explosion-proof motors and control for refining service.

Spirakore transformer, a new development.

Tesla coil and electric furnace.

Curie metal wheel.

One of the latest water coolers operated by photoelectric relay and solenoid valve.

New 150-amp. arc-welding machine.

Representatives: L. T. Blaisdell, Dallas, Texas, commercial vice-president; E. M. Wise, manager Houston, Texas, office; I. T. Hockaday, Houston; G. W. Currie, Houston, and George Prout, Dallas.

•

GENERAL METALS CORPORATION
Houston, Texas

Booth No. 1578 (Annex)

EXHIBITS The display will consist of typical oil-field forgings and dies used in their production.

Representatives: W. A. DeRidder, president; H. W. Schmid, general manager; M. B. Loughridge, sales engineer, and C. W. Butts, works office manager.

•

GENERAL MOTORS CORPORATION
Diesel Engine Division
Cleveland, Ohio

Exhibiting in Stewart and Stevenson section.

L. H. GILMER COMPANY
Philadelphia, Pennsylvania

Booth No. 767

EXHIBIT: Gilmer V-belts in multiple sizes and Kable Kord flat belting.

Representatives: M. R. Oberholzer, sales manager; D. A. Cant, C. P. Williams, and Fred Sintes, Jr., district managers.

•

GILMORE WIRE ROPE DIVISION OF JONES AND LAUGHLIN STEEL CORPORATION
Muncy, Pennsylvania

See exhibits of Jones and Laughlin Steel Corporation and Frick-Reid Supply Corporation.

•

GOODALL RUBBER COMPANY OF TEXAS
Houston, Texas

Booths Nos. 565 and 566

EXHIBIT: A complete line of mechanical rubber goods, featuring especially the Goodall Long-Life rotary hose and Barney couplings; rotary hose for all kinds of digging from the "post hole" type to 10,000 ft. and better. A complete line of steam hose led by Inferno. For the marketing end of the industry will be shown Goodall Newtype Cord, Newtype Synplastic for wet service, hose for the tank truck, hose for the curb pump, hose to fill the radiator, for the air pump, the grease pump, and for washing the car. There will be many types of hose shown but especial attention will be given to Long-Life rotary hose and Barney couplings. There will be a complete display of Flexitallic gaskets for which Goodall is the distributor.

•

GOODALL SEMI-METALLIC HOSE AND MANUFACTURING COMPANY
Philadelphia, Pennsylvania

Exhibiting in J. E. Bobo section.

•

GOULDS PUMPS, INC.
Seneca Falls, New York

Exhibiting in Southern Engine and Pump Company section.

•

GRANT OIL TOOL COMPANY
Los Angeles, California

Booth No. 1580 (Annex)

EXHIBIT: Will feature the Grant roller-bearing cutter reamer. In this tool the cutters are mounted at such an angle that they provide a cutting and shearing action and are always in contact with the formation whether being raised, lowered, or rotated, the makers assert.

The Grant 2-blade hydraulic expansion wall scraper having an expansion range of 4 in. to 40 in. will also be shown. This tool embodies a patented feature known as the circulation control head, which results in the virtual elimination of wear on the inside assembly by controlling the sand-laden fluid that circulates through the tool.

Grant underreamers and rotary hole enlargers, combining hydraulic and spring expanding action will be demonstrated. Other tools in the exhibit will be the Grant hydrostatic bailer and hydrostatic perforation cleaner, adjustable liner puller, liner hangers, lightning change cement head and circulation head.

Representatives: T. J. Mullins, Norman H. West, and John Grant.

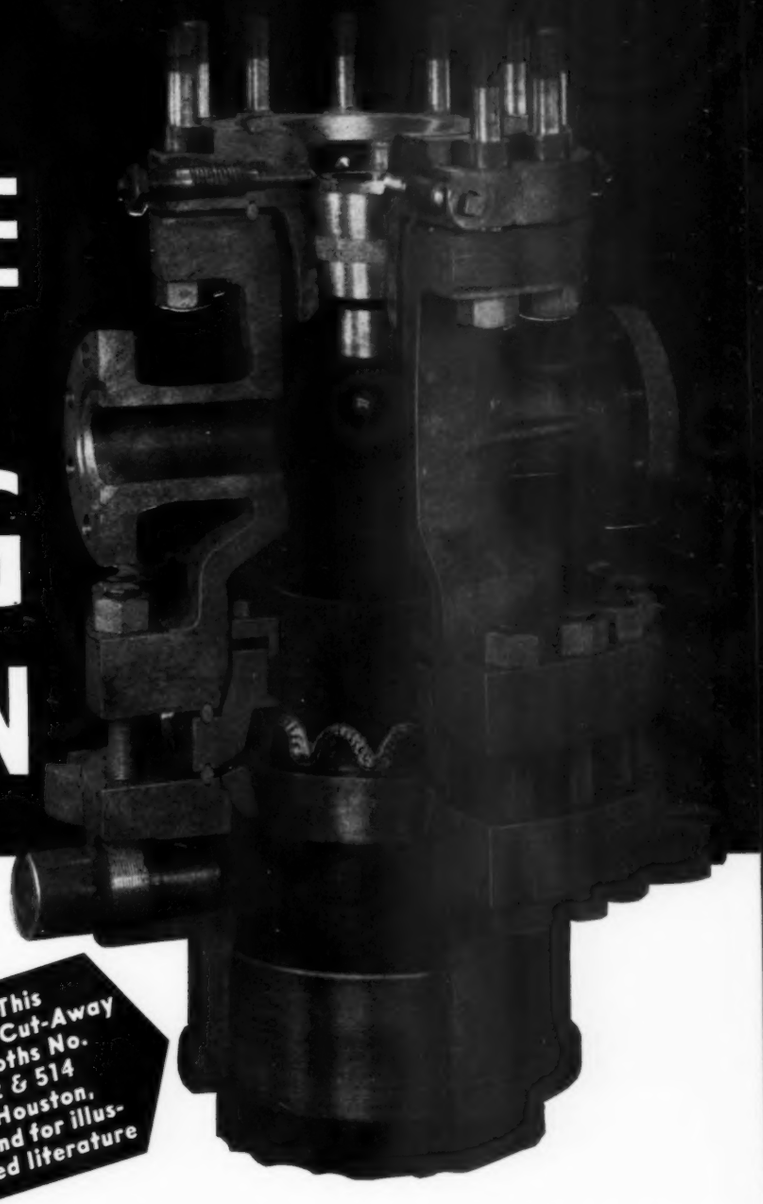
•

GRAY TOOL COMPANY
Houston, Texas

Booths Nos. 444, 446, 448, 545, 547, and 549

EXHIBIT: Rotary drilling and fishing tools, including Gray swivels, will be shown together with Gray systems of well control and accessories used therewith. Included in the units shown with our systems of well control will be the composite manifold and

NEW DEPENDABLE CASING SUSPENSION



See This Full-Size Cut-Away in Booths No. 512 & 514 at Houston, or send for illustrated literature

Unretouched photo showing welding ring welded to 8⅝"—44.7 lb. A.P.I. Grade D Seamless casing, tested in tension to 630,000 pounds without evidence of failure of the weld.

BAASH-ROSS TOOL COMPANY

Los Angeles - Houston - Oklahoma City

Export Office:
30 Rockefeller Plaza, New York City

STRONGER, SAFER, EASIER, QUICKER than ALL other methods of suspending casing

BAASH-ROSS

Type "W"

LANDING AND CASING HEADS

Gray valve removal under equalized pressure.

Representatives: R. A. Mueller, president; Roger Smith, vice-president; C. E. Richards, sales manager; Ray E. Kollar; John Lemley; C. E. Heath; J. D. Isaacks; Earl Weaver, and J. R. Yancey, chief engineer.

●

GREENE, TWEED AND COMPANY
New York, New York

Booth No. 1567 (Annex)

EXHIBIT: Equipment on display will include lubricated packings under the following brand names: "Palmetto" packing, "Palco" packing, "Cutno" packing, "Pelro" packing, "Super-Cutno" packing, and "Glaso" packing.

Packings all are internally lubricated and designed to meet every condition prevailing in oil refineries. "Glaso" packing is made of fiber glass and is lubricated.

In addition Favorite Reversible Ratchet Wrenches, Basa Rawhide Faced Hammers, and Empire Rawhide Mallets will be displayed.

Representatives: Frank J. Hill, New York; and Norman W. Wallingford, Los Angeles, California.

●

GRESHAM SALES COMPANY
Houston, Texas

Exhibiting in Grove Regulator Company section.

●

GROVE REGULATOR COMPANY
Oakland, California

Booths Nos. 1525 and 1527 (Annex)

●

THE GUIBERSON CORPORATION
Dallas, Texas

Booths Nos. 1111, 1113, and 1115 (Annex)

EXHIBIT: Equipment to be exhibited includes P. L. rotary high-pressure pump; gas-lift equipment: flow valve and intermitter; Type "E" drilling head, rotating blow-out preventer and stripper; tubing spider; casing and tubing swabs; control head packers; tubing catchers; wire-line oil savers; sucker rod strippers; high-pressure tubing oil savers; spiral packers; tubing packers, and early models of swabs and tubing catchers showing development of these tools.

The Guiberson Type "C" flow valve and Type "C" intermitter valve operate solely on differential pressure, both in opening and closing, and the velocity of the fluid does not affect its operation. The valve mechanism is of simple design and has only one moving part.

The improved Guiberson Type "E" drilling head having the new lower stuffing box arrangement is used extensively to provide a pack-off, capable of withstanding high and low pressures, between the kelly, drill pipe or tubing, and the casing, in drilling wells under pressure, tubing wells under pressure, or any other application where a back-pressure on the drilling fluid is required. The new lower stuffing box arrangement prevents any foreign matter from entering the housing in which the roller bearings are mounted, the makers state.

The new Guiberson P.L. rotary high-pressure pump is now used by more than 35 major and independent pipe-line companies in practically all oil fields in the United States and in many foreign fields, the makers state. Its simple construction, high efficiency, capacity to pump against high pressures, light weight, and portability have met the demand of the trade for gathering-line and pipe-line service, it is asserted.

Representatives: S. A. Guiberson, Jr., chairman of the board; S. A. Guiberson, III, president; H. M. Haseltine, assistant to the president; Gordon G. Guiberson, executive vice-president and general manager; Al Pranger, chief engineer; H. U. Garrett, sales manager; R. G. Taylor, Jr., service director; I. H. Buck, pump department sales; E. D. Wilde, gas-lift department sales; J. C. Owen, sales representative, and C. L. Forcum, sales representative.

●

GULF ENGINEERS, INC.
Houston, Texas

Booths Nos. 324 and 425

EXHIBIT: Will display the Keil shale shaker, Varco liners and rods, Kelly bushings, Master bushings and rotary pipe slips, and Chiksan all-steel rotary hose and swing joints.

Representatives: E. F. Goggins, president, Gulf Engineers, Inc.; C. A. Muncey, vice-president, Gulf Engineers, Inc.; A. Reinhold, Abegg and Reinhold, and Dean Love, Chiksan Oil Tool Company.

●

GULF TRACTOR EQUIPMENT COMPANY
Houston, Texas

Booth No. 1006 (outside)

Also exhibiting in Caterpillar Tractor Company section.

●

HALLIBURTON OIL WELL CEMENTING COMPANY
Duncan, Oklahoma

Booths Nos. 124, 126, 128, 130, 225, 227, 229, and 231

EXHIBIT: Will exhibit latest Howco service, namely, electrical well logging. Will have a complete well logging truck set-up as in the field. Also, will exhibit prominently Howco Co-Axial Spiral. full line of Howco floating equipment, drill stem testing. and the company's cementing service.

Representatives: C. P. Parsons, vice-president and general sales manager; J. G. Creed, sales engineer; W. R. McClendon, superintendent of Gulf Coast Division; H. F. Clark. assistant superintendent of Gulf Coast Division; and F. T. Robidoux, supervisor of well logging.

●

HAMER OIL TOOL COMPANY
Long Beach, California

Exhibiting in Well Equipment Manufacturing Corporation section.

●

HAMNER-SITTON COMPANY
Houston, Texas

Booth No. 1509 (Annex)

EXHIBIT: Will display removable insulation for steam boilers and steam piping on oil-well drilling rigs using steam power. Will exhibit also a new type gauge line wiper that removes oil residue from the line after a tank reading has been taken, and a new type suction distributor that is installed on the bleed lines of storage tanks to facilitate the removal of water, basic sediment, and paraffins from the bottom of the tank without allowing the oil to channel and be drained at the same time.

Representatives: Leland Hamner, S. A. Wolcott, A. Parrish, and Ivan Parrish.

●

HANLON-WATERS, INC.
Tulsa, Oklahoma

Booths Nos. 166 and 266

EXHIBIT: Equipment on display will include Bassler positive displacement meters, American air filters for engines and compressors, Victaulic couplings for pipe-line work, Hanlon-Waters oil and gas separators, automatic control equipment, etc.

●

HAPPY BELTING COMPANY
Tulsa, Oklahoma

Booth No. 1022-A (outside)

EXHIBIT: The following equipment will be displayed: T-2-5 Happy Pumper, a new line of pumpers put on the market during the last six months. It is a double-reduction, chain-drive line of pumpers, using Diamond roller chains and Timken roller bearings and the chain reduction is built into a heavily ribbed, cast-iron case.

Will also have in booth, two or three representative sizes of Young-Happy engine jacket water coolers (full flow); and a Young heat exchanger used for cooling the lubricating oil in multiple-cylinder engines.

Representatives: A. M. Butcher, engineer; A. F. Nixon, salesman, and J. R. Meek, salesman.

●

HARLEY SALES COMPANY
Tulsa, Oklahoma

Booths Nos. 1515-B, 1517, and 1519 (Annex)

EXHIBIT: Equipment on display will be the company's line of Wisconsin air-cooled engines, Wisconsin marine engines, and pump, compressor, and generator units.

Representatives: Harley B. Neal and James A. Morgan.

●

HARNISCHFEGER CORPORATION
Milwaukee, Wisconsin

Booths Nos. 1040 and 1041 (outside)

EXHIBIT: On display will be the ¾-yard excavating machine. This machine is constructed of rolled alloy steels. The machine will be equipped with a tubular steel dragline boom and dragline bucket. The entire machine will be so mounted that the entire crawler mounting will move, thereby resembling actual machine travel. The machine is also equipped with three-travel speeds. Will also have a display of electric hoists, P&H-Hansen welders. and P&H Smootharc welding electrodes for oil-field work.

Representatives: J. H. Enochs, Dallas, Texas, district manager; G. K. Woodling, Milwaukee, sales manager. Excavator Division; F. Salditt, Milwaukee, vice-president in charge of sales; R. L. Scollard. Milwaukee. sales manager of Welder Division; E. T. Slackford. Milwaukee, sales promotion and advertising manager.

●

HARRISBURG ENGINEERING COMPANY
Houston, Texas

Booths Nos. 1132, 1134, 1247, and 1249 (Annex)

EXHIBIT: Harrisburg forged-steel regular and "Diamond Special Alloy" slush pump liners, forged-steel bull plugs, companion flanges, and pipe couplings—from raw materials to the finished product.

Emsco "engineered" rotary brake lining sets and other types of brake lining, which controls abrasive action, prevents scoring without excessive drum wear, and delivers smooth, safe braking, according to the makers.

"Universal" 7¼ in. by 16 in. power slush pump, operated by small electric motor.

Representatives: J. E. Snoddy, president, and C. A. Lange, district manager, Harrisburg Engineering Company; H. B Liggett, general manager; H. M. Reeser, sales manager, and O. C. Thomas, sales engineer, Harrisburg Steel Corporation, Harrisburg, Pennsylvania; A C. Stearns, sales manager, and George deBeaumont, sales engineer, Emsco Asbestos Company, Downey, California; and H. E. Muchnic, president, and A. H. Moorhead, sales manager, The Locomotive Finished Material Company, Atchison, Kansas.

●

HAYNES STELLITE COMPANY
Kokomo, Indiana

See Union Carbide and Carbon Corporation exhibit.

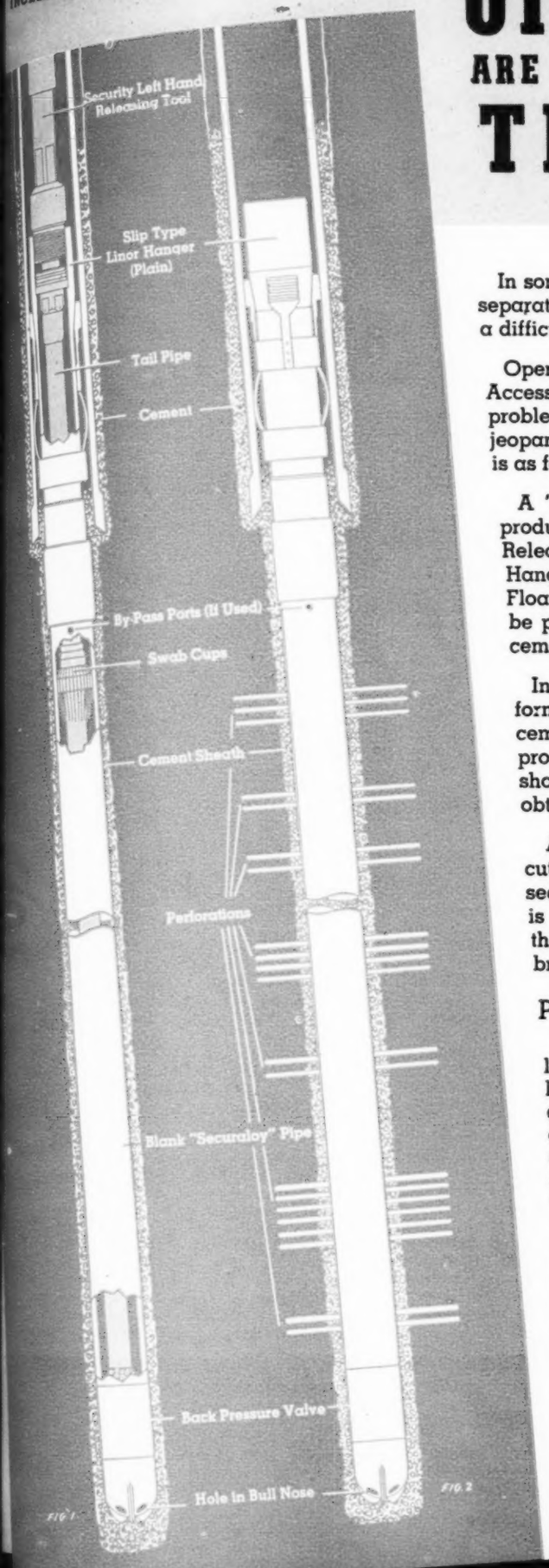
●

THE HAYS CORPORATION
Michigan City, Indiana

Exhibiting with W. H. Curtin and Company.

NO. 4 OF A SERIES SHOWING HOW "SECURALOY" INCREASES DEVELOPMENT EFFICIENCIES

OIL "STRINGERS" ARE DEVELOPED MORE EFFICIENTLY THIS NEW WAY!



In some wells, production is obtained from numerous oil "stringers" separated by gas or water sands—making economical oil production a difficult problem.

Operators have found the use of "Securaloy" Drillable Pipe and Accessories to be an efficient solution for this type of development problem and are now able to produce each zone to depletion without jeopardizing the full producing life of their wells. One popular method is as follows:

A "Securaloy" Drillable Liner, sufficiently long to blank off all producing zones or "stringers," is run in on a Security Left Hand Releasing Tool. This liner may be run with either a Security Drillable Hanger or a Security Drillable Adapter and should have a Drillable Float Shoe on bottom. At excessive depths, equalizing ports should be provided, and a tail piece carrying a swab cup is inserted for cementing below perforations in the accepted manner (fig. 1).

In cementing the liner, the annular space between it and the formation is cemented solid, thus separating all zones. Next, the cemented liner is perforated opposite the known oil sands to be produced (fig. 2). The sands can be developed as needed and should additional gas be required to produce the oil, it can be obtained by perforating opposite the desired gas strata.

As each sand becomes depleted, the liner opposite the zone is cut out and a cement plug set. By completely removing the liner section, a more satisfactory bottom plug is obtained since the bond is accomplished directly with the formation at all points and not through perforations. This reduces the possibility of bottom water breaking in.

PROVIDES FOR FUTURE DEVELOPMENT

There is an important advantage in the use of "Securaloy" for this application. The sands are not always clearly defined and should the perforating of an unsuspected gas or water sand jeopardize the well—and shut-off efforts prove unsuccessful—then the entire liner can be drilled up, a new one set, and the producing area developed over again. This valuable feature fully protects the well against unpredictable contingencies!

In addition if it is later desired to explore for deeper zones, the "Securaloy" equipment *can be completely drilled up and circulated out of the hole,* thus placing the well in the best possible condition for subsequent drilling operations. Full particulars on this or other "Securaloy" applications will be gladly sent on request.

THE SECURITY LEFT HAND RELEASING TOOL

Assures *positive* release under all conditions • *Automatically* eliminates all weight on releasing thread • Sets extremely lightweight accessories as efficiently as heavy ones • Built-in tail pipe connection and pack-off for cementing operations. SEND FOR BULLETIN!

SECURITY ENGINEERING CO., INC.

WHITTIER, CALIFORNIA • PHONE 42004

MID-CONTINENT: 5525 CLINTON DR., HOUSTON, TEX., PHONE CAPITOL 9538 • NEW IBERIA, LA. (Box 121) PHONE 1309

EXPORT: SECURITY ENGINEERING CO. INC., 420 LEXINGTON AVENUE, NEW YORK CITY

Sievers Reamers ★ Securaloy ★ Security Drillable Products

HAZARD WIRE ROPE DIVISION OF AMERICAN CHAIN AND CABLE COMPANY, INC.
Wilkes-Barre, Pennsylvania

Exhibiting with American Chain and Cable Company, Inc.

•

HERCULES MOTORS CORPORATION
Canton, Ohio

Booths Nos. 438, 440, 539, and 541

EXHIBIT: To show complete line of gasoline, natural gas, and Diesel power units arranged for oil field applications. In the exhibit will be the following units: NXB 3¼ in. by 4 in., 2-cylinder closed power unit; ZXB 2⅝ in. by 3 in., 4-cylinder closed power unit; IXB 3¼ in. by 4½ in., 4-cylinder closed power unit; OOC 4 in. by 4½ in., 4-cylinder closed power unit; JXC 3¾ in. by 4¼ in., 6-cylinder closed power unit; RXC 4⅝ in. by 5¼ in., 6-cylinder closed power unit; HXB 5 in. by 6 in., 6-cylinder closed power unit; HXE 5¾ in. by 6 in.. 6-cylinder closed power unit, and RXB 4½ in. by 5¼ in., 6-cylinder open power unit. All have many special low-fire-hazard features and are especially arranged for oil-field installations.

All these units will be arranged for operation on natural gas.

In addition to these will be shown: DOOC 4 in. by 4½ in., 4-cylinder Diesel closed power unit; DJXC 3¾ in. by 4½ in., 6-cylinder Diesel open power unit; DRXB 4⅜ in. by 5¼ in., 6-cylinder Diesel open power unit, and DHXB 5 in. by 6 in., 6-cylinder Diesel closed power unit.

A DJXC engine, mounted on a pedestal and sectioned to show the internal construction of the engine also will be on display.

Of further interest will be the Special Hercules Diesel Replacement Package Unit arranged with the necessary mounting parts and accessories for installation in the standard Ford truck chassis, either conventional or cab-over-engine types and arranged for either right- or left-hand drive.

Representatives: Display will be in charge of our A. B. Wehling, Mid-Continent manager; others in attendance will be John C. Keplinger, vice-president; D. W. Latta, sales manager; R. J. Scott, sales engineer; Fred C. Goldsmith, sales engineer, and Raymond T. Lewis, sales engineer.

•

HEWITT RUBBER CORPORATION
Buffalo, New York

Exhibiting in Norvell-Wilder Supply Company section.

Representatives: F. H. Dickinson, Houston, Texas; C. T. Sowden, Dallas, Texas; Bryan Frere, New Orleans, Louisiana, and L. D. Bigelow, vice-president, Buffalo.

•

HIGHWAY TRAILER COMPANY
Edgerton, Wisconsin

Booth No. 1024 (outside)

EXHIBIT: The equipment to be exhibited is a portable Model DW Oil Well Drilling Machine.

Representatives: J. W. Menhall, president, and George Connors.

•

HOBART BROTHERS COMPANY
Troy, Ohio

See exhibit Gil V. Dye Company.

•

HOPPER MACHINE WORKS
Bakersfield, California

Exhibiting in American Iron and Machine Works Company section.

•

A. C. HORN COMPANY OF TEXAS PETROLEUM DIVISION
Houston, Texas

Booth No. 1301 (Annex)

EXHIBIT: Oil field paints and mud-cleaning chemicals will be on display.

Representatives: E. M. Bishop, president; C. E. Lambert, vice-president; Fritz Daniels, New York, research chemist, Joe Branch, field engineer; A. L. Huntley, salesman, and Sam Glover, salesman.

•

HOUSTON ENGINEERS, INC.
Houston, Texas

Booths Nos. 141-C and 141-D

EXHIBIT: Equipment on display will include the following: (A) H-E Edwards reversing tool service; (B) H-E Edwards releasing rotating overshot; (C) H-E Edwards releasing rotating spear; (D) H-E Edwards releasing cut and pull casing and drill pipe cutter; (E) H-E Edwards improved thread for oil well fishing taps; (F) H-E Edwards mudscale, a device for continuously indicating mud weight on derrick floor.

Representatives: Charles R. Edwards, J. A. Dormant, R. M. Claypool, and D. M. Best.

•

HOUSTON OIL FIELD MATERIAL COMPANY, INC.
Houston, Texas

Booths Nos. 150, 152, 154, 156, 158, 160, 251, 253, 255, 257, 259, and 261

EXHIBIT: Co-exhibitors with Houston Oil Field will be Hazard Wire Rope Company, The Wheland Company, Chattanooga, Tennessee; Mid-Continent Mud Company, Houston; Edw.. H. Fitler Company, and E-Z Pull Corporation. Their equipment and the regular line of Homco oil-field equipment will be shown.

Representatives: A. W. Waddill and others.

•

HOUSTON OXYGEN COMPANY
Houston, Texas

Exhibiting with Big Three Welding Equipment Company.

•

HOUSTON SLUSH PUMP REPAIR COMPANY
Houston, Texas

Booths Nos. 1121 and 1123 (Annex)

•

HUGHES TOOL COMPANY
Houston, Texas

Booths Nos. 524, 526, 528, 530, 625, 627, 629, and 631

EXHIBIT: Virtually all products of the Hughes Tool Company will be on display in a very interesting and comprehensive manner, featuring all recent improvements and developments in equipment, sectioned so that interior construction and workmanship may be viewed to best advantage.

Products exhibited will include rock bits, core bits, tool joints, reamers, drill collars, valves and fittings, chokes, tubing and flow heads, completely assembled Christmas trees, and other specialized oil industry tools.

Representatives: An adequate staff of attendants will be present at all times to explain and demonstrate all improved features of Hughes tools. These men will include representatives of both sales and engineering departments.

•

HUMBLE OIL AND REFINING COMPANY
Houston, Texas

Booths Nos. 5 and 7

EXHIBIT: Display of oil-field products and murals depicting their use.

Representatives: The booths will be supervised by two salesmen experienced in the application and uses of these products.

•

HUNT TOOL COMPANY
Houston, Texas

Booths Nos. 628, 630, and 632

EXHIBIT: Hunt wire line core barrel, core bits, drilling bits, Reagan gas burner, and Red Top valves, together with other Red Top safety devices.

Representatives: T. N. Hunt, U. V. Seales, R. O. (Slim) Harris, J. O. (Nick) Carter, P. M. Hunt, and Tom Reagan.

•

HUTCHISON ENGINEERING WORKS
Chicago, Illinois

Exhibiting with Oceanic Engineering Works.

•

HYATT BEARINGS DIVISION
General Motors Corporation
Harrison, New Jersey

Booths Nos. 704 and 706

EXHIBIT: Will feature the many applications of Hyatt Roller Bearings in drawworks, rotaries, blocks, pumping units, pumps, engines, etc.

Representatives: H. K. Porter, general sales manager, and H. M. Carroll, advertising manager, from Harrison, New Jersey; C. L. Newby, manager, F. H. Webster, sales engineer, A. J. Swisler, sales engineer, and J. L. Haynes, division engineer, from the Chicago divisional office; J. M. Kelly, manager, from the Pittsburgh divisional office, and L. S. Nagle manager, from San Francisco.

•

HYDRIL COMPANY
Los Angeles, California

Booths Nos. 653 and 655

EXHIBIT: Equipment on display: Hydril joints for external flush drill pipe, internal flush drill pipe, and external and internal upset drill pipe. Hydril automatic blow-out preventers. Hydril joints for external upset tubing. Hydril joints for external upset casing and flush joint casing. Hydril equipment for pressure drilling.

Representatives: Bert L. Stone, general manager; Earl M. Daniels, general sales manager; C. S. Banta and C. E. McCarthy, Houston representatives; Morgan Jones, Jr., South Texas representative; W. O. Moore and G. B. Fleming, South Louisiana representatives; J. Gordon Bird, West Texas representative, and J. P. Magoffin, Oklahoma representative.

•

INDUSTRIAL SALES AND ENGINEERING COMPANY
Houston, Texas

Exhibiting in Dodge Manufacturing Corporation section.

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INDUSTRIAL-SCIENTIFIC SUPPLY COMPANY
Houston, Texas

Booth No. 449

EXHIBIT: Industrial-Scientific Supply Company, Houston and Fort Worth, representing Taylor Instrument Companies, Rochester, New York, will have on exhibit Taylor instruments for indicating, recording, and controlling temperature, pressure, flow, and liquid level.

Representatives: A. J. Fleig and R. E. Clarridge of Taylor Instrument Companies, Rochester, New York; E. H. Triphaus and L. G. Marsh of Taylor Instrument Companies, Tulsa, Oklahoma; B. H. Wilson of Industrial-Scientific Supply Company, Fort Worth, Texas; R. E. O'Neill and F. W. Wellborn of Industrial-Scientific Supply Company, Houston, Texas.

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INGERSOLL-RAND COMPANY
New York, New York

Booth No. 1550 (Annex)

EXHIBIT: Type TRV turbine pump, a built-in type of turbine-driven centrifugal water pump. Will also display parts and illustrations of large engines and compressors.

Representatives: F. W. Sultan, manager, Houston office; W. H. Lee, manager, Dallas office; J. J. Janzen, engineering department, New York; W. F. Dalton, sales department, Houston, Texas; D. T. Whiting, sales de-

partment, Longview, Texas; Giles Brayden, sales department, Dallas, Texas, and Roy Henry, sales department, Corpus Christi, Texas.

INGERSOLL-RAND MARKETING DIVISION
New York, New York

Exhibiting in Stewart and Stevenson section.

INTERNATIONAL DERRICK AND EQUIPMENT COMPANY
Columbus, Ohio

Booth No. 1047 (outside)

EXHIBIT: An entirely new design of Ideco unit pumper will be shown. This pumper embodies many improvements, prominent among which is the use of needle-type beam bearings. All beam bearings are needle-type roller bearings and are self-aligning. They are totally enclosed and perfectly sealed. These bearings are pressure lubricated from the samson post.

Each pumper is equipped with the new Ideco Wheel-Type Counterbalance. The design of this counterbalance permits easy and safe adjustment and gives the utmost in precision balancing, the manufacturers state.

Wrist pins are equipped with double Timken bearings, self-aligning in seal-enclosed housings.

Ideco will also display the following equipment, which is manufactured in its Beaumont plant:

(a) Portable unit drawworks for drilling 5000 ft., which incorporates many advanced engineering principles.
(b) 17¼-in. oilbath streamlined rotary.
(c) Roller kelly drive.
(d) Single shaft, 4-sheave crown block.
(e) Mechanical rig having reverse clutch and rotating elements powered by two 225-hp. Diesel engines.

Representatives: L. J. Brown, president, Columbus, Ohio; C. R. Athy, Columbus, Ohio; J. M. Aitken, Columbus, Ohio; L. L. Powell, Houston, Texas, district office; L. R. Spencer, Houston; E. H. Eddleman, general sales office, Dallas, Texas; Richard R. Bloss, Beaumont, Texas, plant; H. F. Shepherd, Beaumont; W. O. Cook, Beaumont; W. H. Cumberland, Beaumont, and C. G. Booker, Beaumont.

INTERNATIONAL EQUIPMENT COMPANY
Boston, Massachusetts

Exhibiting in W. H. Curtin and Company section.

INTERNATIONAL HARVESTER COMPANY
Chicago, Illinois

Booths Nos. 1034 and 1036 (outside)

EXHIBIT: An assortment of motor trucks, tractors, and power units especially equipped for oil-field work.

A feature of the display will be the new Model TD-18 full Diesel 6-cylinder TracTracTor. Having a maximum belt hp. of approximately 80 and a drawbar hp. of 70, the new TD-18 becomes the largest in the International crawler tractor line, which now consists of three Diesel models and three gasoline models. Among the latter-named also to be on display will be the TD-40 and TD-35 Diesel TracTracTors equipped with winches, pipe booms, and other oil-field equipment.

As in the case of other International Diesels, the TD-18 engine is provided with a distinctive method of starting by which it starts on gasoline and, after a minute or less of operation, shifts to full Diesel operation. A conventional automotive-type electric starter is regular equipment, and with it the engine is started easily from the seat, regardless of weather, the makers state. The tractor operates at six forward speeds of from 1½ to 5¾ m.p.h. and two reverse speeds.

Among the International motor trucks to be shown will be the big 6-cylinder Model AR-626-F 6-wheeler having a rated capacity of from 10 to 15 tons; the 1½ to 2-ton Model DS-35 having 2-speed rear axle, and the Model ½-ton D-2 pick-up. On all these models typical oil-field equipment will be mounted.

Seven of the various International power unit models will be displayed, including the new Model U-10. This new engine has a maximum hp. of 45 and is provided with base and other equipment especially suited for oil-field work. The maximum horsepowers of the power units to be shown range from 22.5 for the P-12 to 110 for the PA-100.

Special displays will include cut-out motor truck and Diesel engines, Tocco-hardened crankshaft display, and magneto display. The International industrial wheel-tractor line will be represented by the Model I-14.

Representatives: L. M. McWhirter, manager, the International Harvester Company, Houston, Texas, will be in charge of the display. Attendants will include W. F. McAfee, sales manager, Chicago; P. V. Moulder, manager, motor truck sales, Chicago; Neal Higgins, in charge, industrial equipment sales; R. E. Butler, manager, Southwest District, Chicago; and branch managers J. J. Foley of Dallas, Texas, J. M. Ryan of San Antonio, Texas, B. N. Roberts of Sweetwater, Texas, R. W. Elliot of Tulsa, Oklahoma, and R. E. Jaquier of Oklahoma City, Oklahoma.

THE INTERNATIONAL NICKEL COMPANY, INC.
New York, New York

Booths Nos. 602 and 701
And in Metal Goods Corporation section

EXHIBIT: Display will be designed to show in a general but comprehensive way the extent to which alloys of nickel are employed in the production and refining branches of the petroleum industry. It is planned to have very few actual exhibits of oil tools or parts, but there will be a flow chart of the industry on the background, having electrical animation, which will show what alloys of nickel are employed and where they are used.

Representatives: S. W. Strahan will be in charge of the exhibit. Other members of the organization present will include B. B. Morton, Development and Research Division, specializing in refinery problems; A. G. Zima, Pacific Coast representative, specializing in production problems; Frank Bailey, Monel and Rolled Nickel Sales Department; also representatives of distributors in the Mid-Continent territory.

JACOBS WIND ELECTRIC COMPANY, INC.
Minneapolis, Minnesota

Booths Nos. 1558 and 1560 (Annex)

EXHIBIT: A wind-driven generating unit for cathodic protection of pipe lines. Also, the company's new heavy-duty, slow-speed engine for use in cathodic protection work.

JANNEY CYLINDER COMPANY
Holmesburg, Pennsylvania

Exhibiting with Ayres Engineering Company.

JARECKI MANUFACTURING COMPANY
Erie, Pennsylvania, and St. Louis, Missouri

Booth No. 746

EXHIBIT: Will display a variety of Jarecki valves and fittings, including brass, malleable, and gray iron pipe fittings, and brass and iron body gate valves. Also, several Jarecki oil well specialties.

Representatives: J. F. Eaton, B. B. Curry, Ed S. Rankin, and N. G. Blankenship, all of the Houston office and store.

THE JEFFREY MANUFACTURING COMPANY
Columbus, Ohio

Booths Nos. 659 and 661

EXHIBIT: A new and improved design of shale shaker and all grades of oil-well drilling chains will be displayed. Also equipment for refineries.

Representatives: Neil E. Salsich, vice-president and general sales manager; C. R. Heller, vice-president in charge of engineering sales; L. E. Brill, products sales manager; T. P. Burke, Texas district manager, and H. F. Adrian, sales engineer.

JENKINS BROS.
New York, New York

Booths Nos. 233 and 235

EXHIBIT: A complete line of Jenkins bronze, iron, and stainless steel valves featuring types and patterns of particular interest to all branches of the petroleum industry.

Representatives: H. J. Barnsley, engineer; W. Boyce White, sales representative; and F. J. Klemann, sales representative.

M. O. JOHNSTON OIL FIELD SERVICE CORPORATION
Los Angeles, California

Booths Nos. 1125 and 1127 (Annex)

EXHIBIT: Equipment on display will include: Testing tools, packers, pressure recorders, tool joint refacer, Bryan flow valves, Johnston Vibro jar, rat-hole reamer and washer, and adjustable flow beans.

Representatives: M. O. Johnston, T. A. Andrew, and W. F. Bettis.

M. O. JOHNSTON OIL TOOLS, INC.
Los Angeles, California

See exhibit of M. O. Johnston Oil Field Service Corporation.

THE S. M. JONES COMPANY
Toledo, Ohio

Booths Nos. 1239 and 1241 (Annex)

EXHIBIT: All Jones products including sucker, pull, pony, and polished rods, and the Kemler Well Weigher.

Representatives: P. C. Jones, president; H. K. Browning, sales manager; D. O. Johnson, manager field engineering department; L. J. Pundt, division manager; C. E. Buchner, district representative, and J. W. Lowes, district representative.

JONES AND LAUGHLIN STEEL CORPORATION
Pittsburgh, Pennsylvania

Booths Nos. 645, 647, 649, and 651

EXHIBIT: Will feature our complete line of tubular products for the petroleum industry, and the products of the new Gilmore Wire Rope Division.

Representatives: L. M. Parsons, vice-president; V. A. Jevon, assistant to vice-president; W. H. Wiewel, assistant general sales manager; J. O'H. Anderson, sales manager, Tube Division; A. P. Holloway, Tube Department; James G. Watson, field representative; H. P. Quinn, field representative; N. R. Putnam, field representative; W. C. Jamieson, field representative; A. H. Quay, Metallurgical Department; H. L. Summers, chief inspector, Tube Division; H. N. Keener, development engineer, Tube Division; H. E. Fisher, superintendent, Tube Division; A. E. Crockett, manager, Bureau of Instruction; R. M. Gibbs, advertising manager; F. D. Wins-

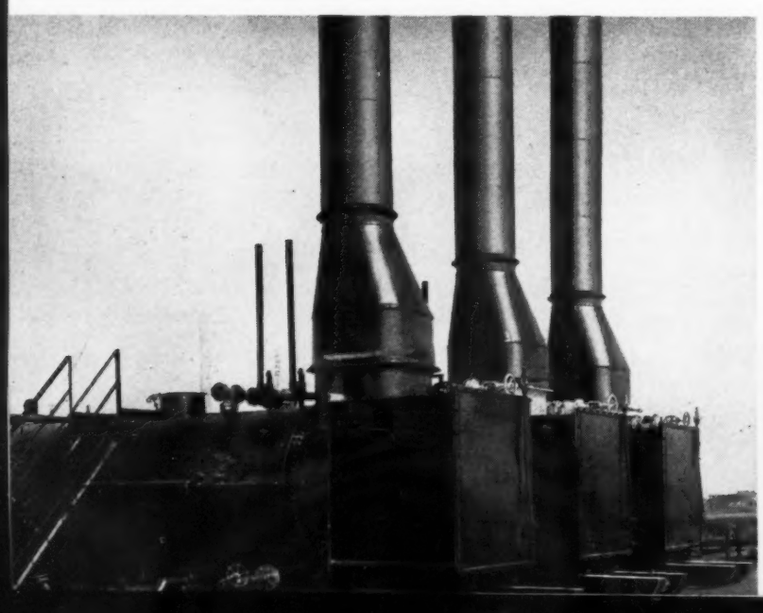
(Continued on Page 118)

● MAIN ILLUSTRATION

SO MUCH LESS FUEL was being used by these "Oilwell" Superheated Steam Generators in comparison with conventional boiler plants at Rosecrans, Calif. that the gas company sent a man to check the meter—but it checked "OK." The saving was a result of the higher efficiency of "Oilwell" equipment. Superheated steam makes it practical and economical to drill several wells from this one central plant without moving the equipment.

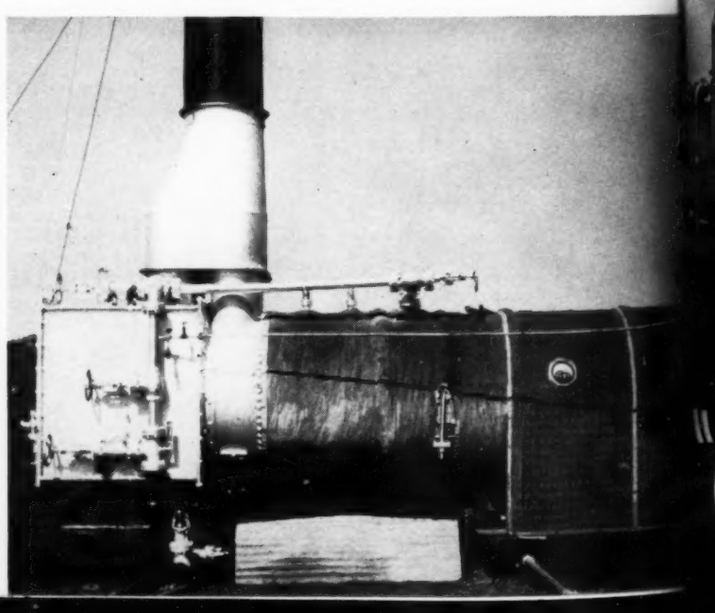
● BOTTOM LEFT

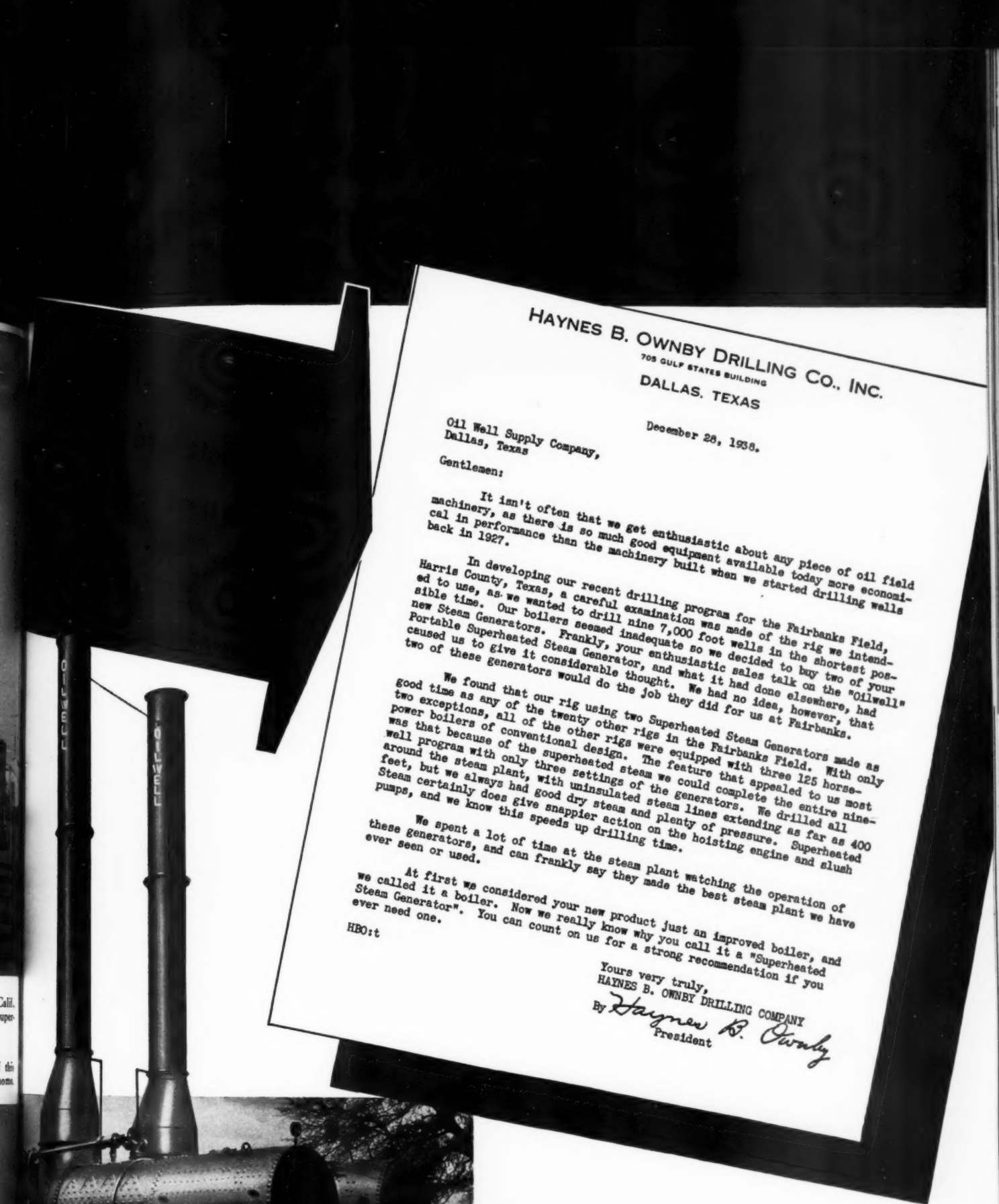
SNAPPY ACTION and plenty of good dry steam from this battery of three Portable "Oilwell" Superheated Steam Generators at Wasco, California.



● BOTTOM RIGHT

"OILWELL" Flexible-Blanket Insulation increases the efficiency of this "Oilwell" Portable Superheated Steam Generator near Ada, Oklahoma.





HAYNES B. OWNBY DRILLING CO., INC.
705 GULF STATES BUILDING
DALLAS, TEXAS

December 28, 1938.

Oil Well Supply Company,
Dallas, Texas

Gentlemen:

It isn't often that we get enthusiastic about any piece of oil field machinery, as there is so much good equipment available today more economical in performance than the machinery built when we started drilling wells back in 1927.

In developing our recent drilling program for the Fairbanks Field, Harris County, Texas, a careful examination was made of the rig we intended to use, as we wanted to drill nine 7,000 foot wells in the shortest possible time. Our boilers seemed inadequate so we decided to buy two of your new Steam Generators. Frankly, your enthusiastic sales talk on the "Oilwell" Portable Superheated Steam Generator, and what it had done elsewhere, had caused us to give it considerable thought. We had no idea, however, that two of these generators would do the job they did for us at Fairbanks.

We found that our rig using two Superheated Steam Generators made as good time as any of the twenty other rigs in the Fairbanks Field. With only two exceptions, all of the other rigs were equipped with three 125 horsepower boilers of conventional design. The feature that appealed to us most was that because of the superheated steam we could complete the entire nine-well program with only three settings of the generators. We drilled all around the steam plant, with uninsulated steam lines extending as far as 400 feet, but we always had good dry steam and plenty of pressure. Superheated Steam certainly does give snappier action on the hoisting engine and slush pumps, and we know this speeds up drilling time.

We spent a lot of time at the steam plant watching the operation of these generators, and can frankly say they made the best steam plant we have ever seen or used.

At first we considered your new product just an improved boiler, and we called it a boiler. Now we really know why you call it a "Superheated Steam Generator". You can count on us for a strong recommendation if you ever need one.

HBO:t

Yours very truly,
HAYNES B. OWNBY DRILLING COMPANY
By Haynes B. Ownby
President

● AT LEFT

BATTERY of two "Oilwell" Superheated Steam Generators used by Haynes B. Ownby Drilling Co. Inc., which made as good time as other rigs using three conventional type boilers.

OIL WELL SUPPLY COMPANY

Branch Stores in All Oil Fields

Subsidiary of United States Steel Corporation

"OILWELL"

(Continued from Page 115)

low, district sales manager, Houston; W. R. K. Scott, field representative; Geo. E. Tyson, field representative; David Ghent, field representative; James T. Batchelor, Houston office, and Baird Tewksbury, Jr., Houston office.

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THE JOYCE-CRIDLAND COMPANY
Dayton, Ohio

Booths Nos. 408 and 410

EXHIBIT: Complete line of lifting jacks, both mechanical and hydraulic types, especially the styles designed for oil field service. The following jacks will be featured: Joyce 20-ton and Joyce 50-ton jacks for skidding derricks and heavy-duty service; Joyce emergency jacks of 15-tons capacity for trucks, boilers, and general service; Joyce hydraulic bumper jacks for automobiles; Joyce hydraulic jacks from 1½ to 30 tons capacity for trucks and general service, and Joyce journal and Joyce self-lowering jacks to 100 tons capacity.

Representatives: Huston Brown, vice-president, and Harry B. Burlow, district sales manager.

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KAYE AND MACDONALD, INC.
West Orange, New Jersey

Exhibiting with J. E. Young.

•

KEASBEY AND MATTISON COMPANY
Ambler, Pennsylvania

Booths Nos. 1235 and 1237 (Annex)

EXHIBIT: Insulating materials and packings will be on display.

Representative: W. S. Acuff, Jr.

•

KENNEDY VALVE MANUFACTURING COMPANY
Elmira, New York

Exhibiting in Norvell-Wilder Supply Company section.

•

KEROTEST MANUFACTURING COMPANY
Pittsburgh, Pennsylvania

Exhibiting with Gray Tool Company.

•

KEUFFEL AND ESSER COMPANY
Hoboken, New Jersey

Booth No. 1139 (Annex)

EXHIBIT: Complete line of Wyteface steel tapes for the oil industry. Wyteface is a steel tape having black graduations on crack-proof white surface, easy to read, even in dim light, the makers state.

Representative: A. D. Tasker.

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KIBELE MANUFACTURING COMPANY
Dallas, Texas

Booth No. 1100 (Annex)

EXHIBIT: Description of equipment on display: 3-step and 2-step tubing catchers. These tools feature the long and increased slip areas that provide extra gripping surface without sacrifice of fluid or gas passages.

Reda type tubing catcher. This tool is grooved down one of the fluid passages to provide room for a metal trough and clamps that in turn accommodate the cable supplying electric power to the pump.

Reda type packer. This packer has a flow head containing a bridge that permits the pumping of oil from one orifice in the head and the introduction of gas from the surface through another orifice into the annular space. It therefore is used with combination Reda Pump and gas-lift. Cups are pressure packed.

Valve-in-head packer. No slips are used on this packer and it cannot wedge in the casing. It is adaptable for gas and air-lift and all jobs where conventional packers are ordinarily employed. The packer has a piston valve in the head that can be locked either open or closed. Cups automatically seal the instant valve is closed and pressure is transmitted to them.

Boiler-feed pump pistons and hot water type pistons. The former is the standard Kibele piston made for 16 years. It consists of piston body, rubber packing ring, and follower plate. The hot water type pistons are a more recent development designed primarily for use with pre-heaters on steam-driven rigs. Packing rings are made of a tough, rubber-impregnated fabric compound.

Tubing and casing swabs. Internal fluid expansion is the method employed and all swabs have large fluid passages to permit swift descent into the well. Casing sizes are equipped with relief valves that automatically release excessive loads.

Rod stripper. The Kibele stripper prevents wear on its rubber packings when running rods into the hole, the makers state. Packings are backed-off into recess of housing when rods are running in. When stripping action is desired the packings are again shoved into place by tightening screws. Any wear on packings is compensated for in the same manner. Stripper is made of steel, is light, and easily assembled.

Catchall. This device can be inserted anywhere in tubing string and consists of a Neoprene cup supported by a bowl and mounted on a coupling. Its purpose is to catch all objects such as pliers, slips, bolts, and other small equipment that might by accident be dropped down a well.

Tubing check valve. This valve fastens in the tubing string and allows the oil to surge up the tubing and then traps it so it cannot return to the bottom.

Release valve. This valve was primarily made for use at Oklahoma City in connection with Reda pumps. A multiple number of openings permits any accumulation of gas in the annular space above the pump to be released therefrom into the tubing. The ball valves seat themselves again automatically when the pressure below has been relieved. This device is equipped with a baffle plate that serves as a paraffin scraper.

Representatives: Eric G. Schroeder, James Wilson, and John W. Yerger.

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WALTER KIDDE AND COMPANY, INC.
New York, New York

Exhibiting in W. L. Walker Company section.

•

KIMBLE GLASS COMPANY
Vineland, New Jersey

Exhibiting with W. H. Curtin and Company.

•

M. M. KINLEY COMPANY
Houston, Texas

Booth No. 537

EXHIBIT: On display will be the Kinley Unlatching Rope Socket, designed primarily to facilitate the recovery of wire rope usually left in the hole when the bailer, swab, or other tools become stuck; Kinley Wire Line Gun for cutting stuck bailing lines, perforator lines, sand lines, and drilling lines, and the Kinley Weight Indicator, constructed for use on Halliburton measuring lines.

Representatives: M. M. Kinley and O. V. Borden.

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KINZBACH TOOL COMPANY, INC.
Houston, Texas

Booths Nos. 355 and 357

EXHIBIT: Complete line of whipstocks, milling tools, casing, drill pipe and tubing slips, catheads, pony rod eliminators, Bowen overshots, spears, line wipers, rope sockets, and circulating assemblies.

Representatives: F. Kinzbach, R. B. Kinzbach, E. B. Schulz, Charles W. Eichbaum, Jr., and H. M. Wheeler.

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KOBE, INCORPORATED
Huntington Park, California

Booths Nos. 1418 and 1420 (Annex)

EXHIBIT: A brief description of the display is as follows:

(a) Component parts of a Kobe All-Purpose Hydraulic Pump system, which is a complete fluid-operated oil-well pumping unit, comprising all the necessary equipment required to produce fluid efficiently and economically from wells of any capacity and depth, under all field, well, and operating conditions.

(b) Samples and cross-sections of Kobe Heat-Treated Screen Casing.

Representatives: C. J. Coberly, president; C. M. Rader, division manager; R. G. Ralph, sales engineer; B. M. Moroney, sales engineer, and M. L. Walraven, Jr., sales engineer.

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KOEHLER MANUFACTURING COMPANY
Marlboro, Massachusetts

Exhibiting in E. D. Bullard Company section.

•

KOPPERS COMPANY
Baltimore, Maryland

See exhibit of American Hammered Piston Ring Division of Koppers Company.

•

KRON COMPANY
Bridgeport, Connecticut

Exhibiting in C. G. Forshey section.

•

KYNER-LONG CORPORATION
Fort Worth, Texas

See exhibit of Jon R. Long, Manufacturer.

•

LAMB PISTON COMPANY
Los Angeles, California

Exhibiting with Gulf Engineers, Inc.

•

LANE-WELLS COMPANY
Los Angeles, California

Booths Nos. 364, 366, and 465

EXHIBIT: The following equipment will be shown:

Gun-perforating truck and miscellaneous perforating equipment and samples.

Lane-Wells packers and liner hangers.

Lane-Wells bridging plugs.

Surveying instruments and equipment, both multiple shot and single shot directional instruments, and inclinometers.

Directional-drilling tools, particularly the knuckle joint.

Electrolog curves and general information covering this new service for the Gulf Coast and Mid-Continent.

Representatives: M. E. Montrose, M. T. Higgs, J. E. Huff, Jr., G. E. Matter, and C. R. Searcy.

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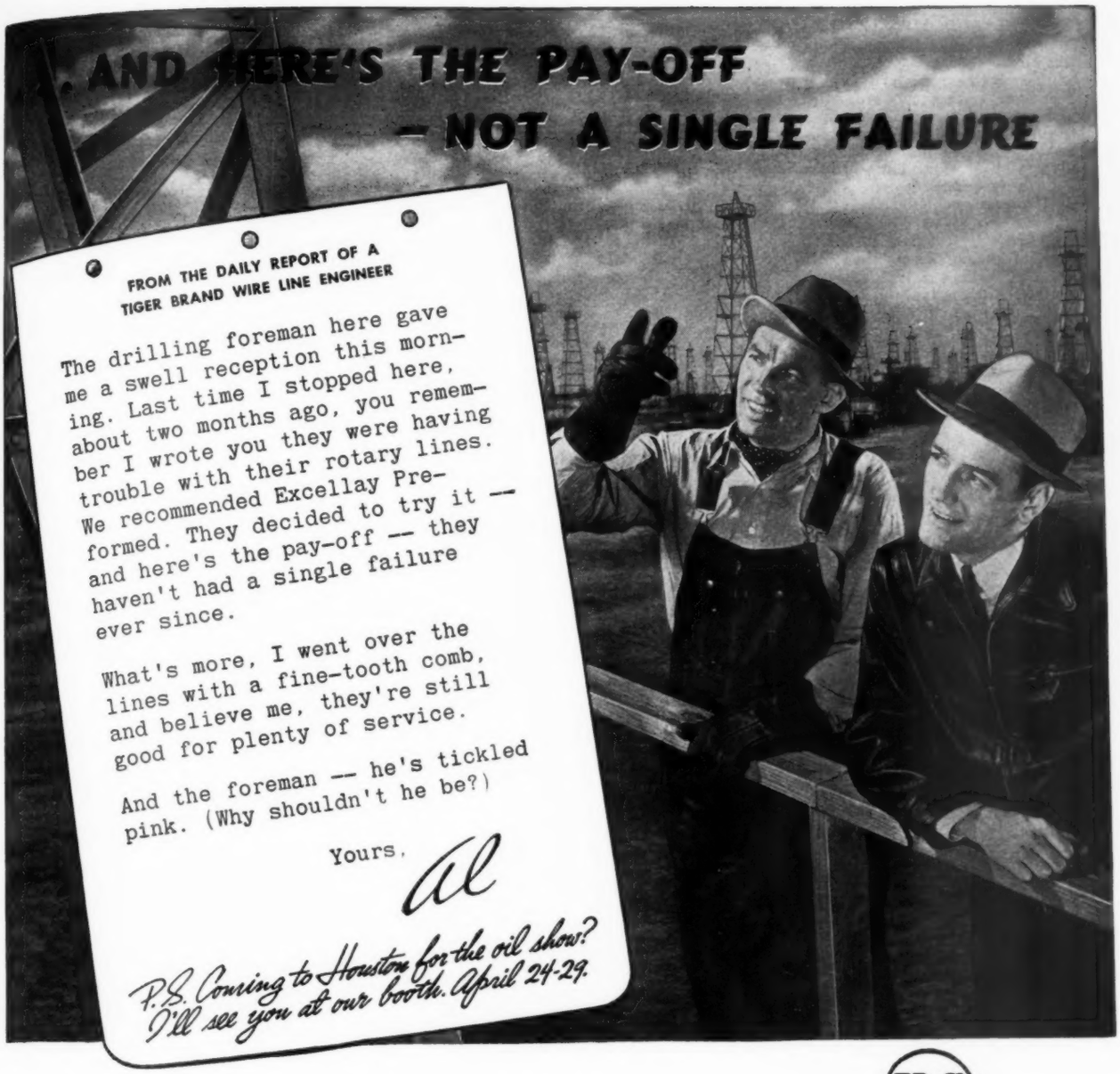
LARKIN PACKER COMPANY
St. Louis, Missouri

Booths Nos. 308 and 310

EXHIBIT: Larkin seamless swage nipples and bull plugs, float equipment, packers, clamps, spiders, tubingheads and casingheads, sand pumps, and liner barrels will be displayed.

Representatives: J. J. Larkin, Sr., St. Louis, Missouri; W. H. Larkin, St. Louis; J. J. Larkin, Jr., St. Louis; C. F. Dougherty, Tulsa, Oklahoma; C. H. Watson, Houston, Texas; F. M. Bohn, Houston; J. J. Dailey, Kilgore, Texas; J. H. Barnard, Shreveport, Louisiana; W. G. Seis, New Iberia, Louisiana; R. W. Johnson, Corpus Christi, Texas, and T. E. Alexander, Corpus Christi.


. AND HERE'S THE PAY-OFF
– NOT A SINGLE FAILURE
FROM THE DAILY REPORT OF A
TIGER BRAND WIRE LINE ENGINEER
The drilling foreman here gave me a swell reception this morning. Last time I stopped here, about two months ago, you remember I wrote you they were having trouble with their rotary lines. We recommended Excellay Preformed. They decided to try it — and here's the pay-off — they haven't had a single failure ever since.
What's more, I went over the lines with a fine-tooth comb, and believe me, they're still good for plenty of service.
And the foreman — he's tickled pink. (Why shouldn't he be?)
Yours,
al
P.S. Coming to Houston for the oil show? I'll see you at our booth. April 24-29.

TURN your wire line questions over to an American Tiger Brand Wire Line Engineer. He lives and breathes wire lines, spends most of his time seeing them in action, checking their performance, studying ways and means of saving you money.

These engineers know what they are talking about, because they spend most of their time right out where the lines are used. They know what punishment they have to stand and how to stretch your wire line dollar. Since American Tiger Brand Wire Lines are made in all constructions and grades, our engineers can specify for you the type which is best suited for your purpose. Write for data.

USS

EXCELLAY
Preformed
WIRE LINES

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

THE LAYNE AND BOWLER COMPANY
Houston, Texas

Booths Nos. 344 and 346

EXHIBIT: Well screens, slotted pipe, packers, set shoes, setting tools, etc., will be displayed and will feature as much as possible the gravel-packing of oil wells. Will be unable to have a piece of gravel-packing equipment at the show, but will have what will be a favorable display of this new method of well completion.

LEBANON STEEL FOUNDRY
Lebanon, Pennsylvania

Booths Nos. 1419 and 1421 (Annex)

EXHIBIT: Various types of carbon, alloy, and stainless steel castings used in equipment built by our customers for refinery and oil field use. These castings will include parts for various types of pumps, valves, turbines, etc.

Representatives: W. H. Worrilow, A. J. McDonald, P. E. Gerhard, and C. H. Folwell, Jr.

LEEDS AND NORTHRUP COMPANY
Philadelphia, Pennsylvania

Booth No. 329

EXHIBIT: Display will consist of three parts:

(a) An operating display showing the importance of automatic standardization to accurate temperature measurement and control.

(b) Micromax Pneumatic Control will be in actual operation to show how the correct relation is maintained between temperature, load, control point, and valve position.

(c) Micromax Multiple-point Recorders show fast temperature recording of six thermocouples, each printed in a different color.

Representatives: R. E. Hansen, Houston, Texas; W. W. Streever, Houston; M. E. Griffith, Tulsa, Oklahoma; G. C. Graf, Philadelphia, Pennsylvania, market extension division, and G. W. Tall, Jr., Philadelphia office, industrial sales manager.

LE ROI COMPANY
Milwaukee, Wisconsin

Booth No. 1046 (outside)

EXHIBIT: Le Roi Model RX1SV, 12-cylinder, 350-hp. drilling engine equipped to operate on either natural gas or butane will be displayed operating on butane gas. Also one Model RX1S, 6-cylinder, 175-hp. drilling engine, which will be operated on natural gas. A series of smaller engines especially built for pumping service and embodying a number of features that have been accepted as necessary for successful pumping service will be shown also, as well as a small light plant specially built for oil-field service.

Representatives: C. W. Pendock, president; W. R. Karll, general sales manager; L. G. Valdes, branch manager, Tulsa, Oklahoma; Boyd F. Koepke, sales engineer, and R. A. Pride, sales engineer.

LE ROY CORPORATION
Houston, Texas

Booth No. 1022-C (outside)

A. LESCHEN AND SONS ROPE COMPANY
St. Louis, Missouri

Booths Nos. 1231 and 1233-A (Annex)

EXHIBIT: The principal part of the exhibit will be a complete line of samples of Leschen Wire Rope used in the oil fields. These samples will be of such lengths as to permit careful and easy examination, and experienced representatives will be present to give complete information to everyone who has any wire rope problems.

Representatives: L. E. Dressler, L. W. Weyler, and E. E. Lambert.

LEWIS MANUFACTURING COMPANY
Meeker, Oklahoma

Exhibiting in Well Equipment Manufacturing Corporation section.

LINCOLN ELECTRIC COMPANY
Cleveland, Ohio

See exhibit of Big Three Welding Equipment Company.

LINDE AIR PRODUCTS COMPANY
New York, New York

See Union Carbide and Carbon Corporation exhibit.

P. K. LINDSAY AND COMPANY
Everett, Massachusetts

Exhibiting in Egner Brothers section.

LINE SCALE COMPANY, INC.
Oklahoma City, Oklahoma

Booths Nos. 1230 and 1232 (Annex)

EXHIBIT: (a) New Alter-Arc, a-c. electric welders. (b) Models of Line Scales.

Representatives: J. C. Conrad, P. Z. Conrad, and H. L. Conrad.

LINK-BELT COMPANY
Chicago, Illinois

Booths Nos. 416, 418, and 420

EXHIBIT: A Link-Belt mud conditioning screen will be exhibited in operation. There will be samples of Hyper, Red-Hed, and Silverlink oil-well drilling drive chains, and a liberal assortment of anti-friction roller bearings. A brilliantly illuminated back wall will illustrate typical drive chain and mud screen installations. Talkative black-faced Amos will again be on hand.

Representatives: Fred Wallace, Bob Horton, Houston, Texas; E. G. Wendell, George Howson, Stuart Penick, Dallas, Texas; C. W. Spalding, C. R. Weiss, Indianapolis, Indiana, and H. L. Strube, Philadelphia, Pennsylvania.

L-K PUMP VALVE COMPANY
Houston, Texas

Booth No. 1236 (Annex)

EXHIBIT: L-K pump valves, pistons, fabricated Bakelite products, pressure gauge protectors, cementing plugs, and tubing plugs.

Representatives: Roy J. Loucks and W. G. (Bill) Sanders.

A. M. LOCKETT AND COMPANY, LTD.
New Orleans, Louisiana

Booths Nos. 1327 and 1329 (Annex)

EXHIBIT: Display will consist of several types of pumps.

Representatives: F. D. Rahm, J. E. Montgomery, E. J. Salaun, and F. J. Ellis, manager, Oil Field Production Division, Worthington Pump and Machinery Corporation.

LOCOMOTIVE FINISHED MATERIAL COMPANY
Atchison, Kansas

Exhibiting with Harrisburg Engineering Company.

EXHIBIT: On display will be Universal slush pump, Universal piston rings, and Universal electroloy and cast-steel check valves.

Representatives: H. E. Muchnic, president; A. H. Moorhead, sales manager; G. W. Taylor, service engineer.

LONE STAR CEMENT CORPORATION
Dallas, Texas

Booths Nos. 1563 and 1565 (Annex)

EXHIBIT: Exhibit will be an informative display on development in oil-well cements, principally "Incor" and "Starcor".

Representatives: J. B. Roberts, J. E. Miffin, W. W. (Dick) Simpson, Everett E. Knott, and B. J. (Bill) Stevens.

JON R. LONG, MANUFACTURER
Fort Worth, Texas

Booth No. 164

EXHIBIT: Exhibit will be jointly by Jon R. Long, manufacturer, and the Kyner-Long Corporation.

Kyner-Long Corporation will show a complete line of gas-lift flow valves, bottom-hole intermitters, well controls, gas-lift fittings, flow controls, and chokes.

John R. Long, Manufacturer, will show a complete line of pumping equipment—working barrels, inserted pumps, balls and seats, drops and seats, check valves, working-barrel valves, wrist pins, back side power units, polished rods, subs, polished-rod clamps, valve pullers, sockets, and polished-rod and wire-line stuffing boxes.

Representatives: R. R. Kyner, E. B. Rainey, Ernest Goldschmidt, Bill Wright, Clyde Kyle, and Jon R. Long.

THE LOUIS ALLIS COMPANY
Milwaukee, Wisconsin

Booth No. 1216 (Annex)

EXHIBIT: Will display new explosion-proof motor, which will make its first public appearance.

Representative: J. D. Brance.

LUCEY BOILER & MANUFACTURING CORPORATION
Chattanooga, Tennessee

Booth No. 1067-A (outside)

LUDLOW VALVE MANUFACTURING COMPANY
Troy, New York

Exhibiting in Mid-Continent Supply Company section.

LUFKIN FOUNDRY AND MACHINE COMPANY
Lufkin, Texas

Booth No. 1066-C (outside)

EXHIBIT: Will exhibit two popular pumping units, TC-3-18A and TC-55-7A.

The TC-3-18A unit is a single reduction herringbone gear unit rated at 27 hp. at a maximum stroke of 54 in. and 17,000 lb. polished-rod load.

The TC-55-7A unit is designed for shallow production. This unit, designed after the fashion of the larger Lufkin units, is made of the same high quality materials and meets all the rigid requirements as regards workmanship, etc., exemplified in all other Lufkin products, the makers state. The unit has a maximum stroke of 42 in. and polished-rod load of 8000 lb.

Representatives: W. C. Trout, W. W. Trout, A. B. Bennett, L. A. Little, and Don Kerr.

LUFKIN RULE COMPANY
Saginaw, Michigan

Booths Nos. 3 and 4

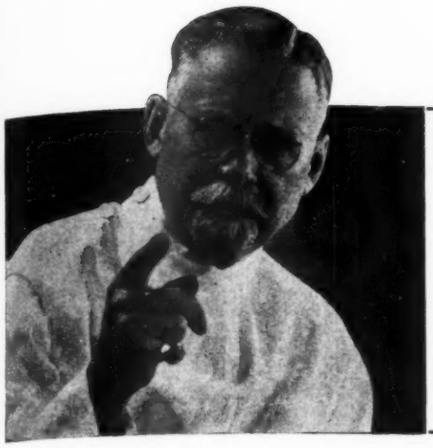
EXHIBIT: Complete display of measuring equipment for the oil industry. This will include all types of measuring tapes, both steel and woven for gauging tanks, strapping tanks, and measuring on the rig. Will also have a complete assortment of steel, aluminum, and wood folding rules, and a display of precision instruments such as micrometers, calipers, squares, indicators, and gauges.

Representatives: R. M. Benjamin, Harry B. Wilson, G. A. Rolander, and E. H. Meibeyer.

LUKENS STEEL COMPANY
Coatesville, Pennsylvania

Exhibiting in Maintenance Engineering Corporation section.

NO ONE TUBE A *"CURE-ALL"*



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. . . but every one tried and tested for a specific condition of heat and corrosion

THE selection of one of these still-tube analyses which best meets your operating conditions may save you thousands of dollars a year, by arresting corrosion, erosion and scaling, and reducing "down time" for tube replacement.

And the best way to find out whether your tube-replacement problem will yield to one of these anlyses is to turn over the facts to one of our specialists, for thorough technical investigation and recommendations.

With all these 21 analyses from which to choose, the man from NATIONAL Tube is ready to give you "Complete Tube Service"—including everything from an analysis of your requirements, to the final selection of the right size, wall thickness, and steel for tubes that will give you most economical service.

When one of our specialists makes a recommendation, you may be sure it is completely unbiased, for he has no interest in promoting any one analysis over another — merely a wholesome interest in giving you the most performance for your money.

That is the way we earn our right to transact business with you. Why not ask one of our specialists to call and demonstrate the meaning of "Complete Tube Service"?

- LOW CARBON
- LOW CARBON, ½ MOLY.
- 1½ SIL., ½ MOLY.
- LOW CARBON, 1 MOLY.
- 1¼ CR., ½ MOLY.
- 1 CR., ½ MOLY., 1-¼ SIL.
- 1¾ CR., ¾ MOLY. (BAIN ALLOY)
- 2 CR., ½ MOLY.
- 2 CR., ½ MOLY., 1-¼ SIL.
- 2½ CR., ½ MOLY, ¾ SIL.
- 2¼ CR., 1 MOLY.
- 3 CR., ½ MOLY., 1-¼ SIL.
- 3 CR., 1 MOLY.
- 5 CR., ½ MOLY.
- 5 CR., ½ MOLY., 1-½ SIL.
- 5 CR., ½ MOLY., TITANIUM
- 5 CR., ½ MOLY., COLUMBIUM
- 18-8
- 18-8, TITANIUM
- 18-8, COLUMBIUM
- 25 CR., 20 NICKEL

Ask about National's COMPLETE TUBE SERVICE, 21 analyses to choose from.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

THE LUNKENHEIMER COMPANY
Cincinnati, Ohio

Booths Nos. 214 and 216

EXHIBIT: The Lunkenheimer exhibit will consist of bronze, iron, steel, and corrosion-resistant alloy valves, lubricating devices, cocks, etc., for use in the petroleum industry. Sectioned models of many of the valves will be shown.

Representatives: Harry A. Burdorf, sales manager; Marshall N. Stickel, sales representative; Jos. A. Birkhead, sales representative; Jos. Waldeck, sales representative; Elmer R. Tieberman, sales representative; D. R. Davis, sales representative, and E. P. Lunken, sales representative.

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MacCLATCHIE MANUFACTURING COMPANY
Compton, California

Booths Nos. 1200 and 1201 (Annex)

EXHIBIT: Products on display will be: MacClatchie hardened and ground slush-pump liners equipped with slip-on glands; MacClatchie Wearever pump pistons for slush pumps, etc.; MacClatchie hardened and ground piston rods; MacClatchie adjustable and non-adjustable flow nipples; MacClatchie Airflote and Streamline slush pump valves; MacClatchie mud pump valve seat pullers and liner pullers; MacClatchie Quick Change cement heads; MacClatchie Quick Change unions equipped with swivel ells; MacClatchie plastic packed Hydro-Seal plug valves; MacClatchie regular Hydro-Seal plug valves; MacClatchie Gearomatic catheads; MacClatchie three-blade hydraulic wall scrapers; MacClatchie rotary underreamers; MacClatchie economy reamer and straight-hole guide; MacClatchie weight indicator; MacClatchie all-steel sliding platform; MacClatchie three-way monkey board.

Representatives: J. W. MacClatchie, president; W. O. Ussery, Mid-Continent manager; O. G. Baker, Clyde Compton, and E. H. Foster, of the sales department.

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MACWHYTE COMPANY
Kenosha, Wisconsin

Booth No. 513

EXHIBIT: Complete line of wire rope for the oil fields, including rotary lines, cable tool lines, sand or bailing lines. Will also have on special display a Macwhyte Whyte Strand 1⅛ in. 6x19FB IWRC Preformed rotary line.

Representatives: H. E. Sawyer, vice-president; A. B. Moseley, assistant sales manager; F. E. Bennett, representative; G. Johnston, representative, and H. M. Robinson, representative.

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MAGNOLIA-AIRCO GAS PRODUCTS COMPANY
Houston, Texas

Booths Nos. 1104, 1106, 1108, 1219, 1221, and 1223

EXHIBIT: Magnolia-Airco Gas Products Company will exhibit with Air Reduction Sales Company and some of the latter's affiliates, Airco oxygen, acetylene, and welding and cutting apparatus and supplies will be on display. There will be demonstrations of machine gas cutting with the No. 6-A Oxygraph and of flame hardening of oil-field equipment.

Representatives: W. A. Sherman, J. F. Pryor, and L. A. Hamilton.

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MAINTENANCE ENGINEERING CORPORATION
Houston, Texas

Booths Nos. 608, 610, 612, 614, 616, 709, 711, 713, 715, and 717

EXHIBIT: General line of oil-field equipment, namely, forged-steel valves and fittings, seamless pipe, and various and sundry specialties manufactured in the company's plant.

Representatives: C. E. Naylor, president; W. J. Peddie, vice-president; W. B. Rawson, in charge of Regulator Division; M. N. Aitken, in charge of production equipment, and C. K. Brown, who will be in charge of the exhibit.

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MANHEIM MANUFACTURING AND BELTING COMPANY
Manheim, Pennsylvania

Exhibiting with Mid-Continent Supply Company.

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MANNING OIL SPECIALTIES
Houston, Texas

Booths Nos. 1552 and 1554 (Annex)

EXHIBIT: On display will be Thompson sand pumps, Amco brake lining, Merritt rat-hole elevator, Merritt pipe hook, "Sure-shot" hydraulic well survey instrument, Purcell cathead (interchangeable sleeve), and Automatic paraffin scraper.

Representatives: M. Manning, Manning Oil Specialties; Henry Beal, Oil Well Survey Instrument Company; Wilks Campbell, Asbestos Manufacturing Company, and A. P. Merritt, Merritt Tool Company.

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MARMON-HERRINGTON COMPANY, INC.
Indianapolis, Indiana

Exhibiting with Transportation Equipment Company.

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MARTIN-DECKER CORPORATION
Long Beach, California

Booth No. 1007

EXHIBIT: The Martin-Decker Quintuplex drilling control instrument, the Clipper type toolpusher, the "Special" illuminated toolpusher weight indicator, the Unitized mud gauge, Individual Type mud gauge, cement pump gauge, pump dynamometer, and other Martin-Decker instruments.

Representatives: E. L. Decker, L. A. Crawford, and Jack Clemens.

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MARVEL-SCHEBLER CARBURETER DIVISION
Borg-Warner Corporation
Flint, Michigan

Booth No. 1518 (Annex)

EXHIBIT: To display Diesel injector and oil-burning carburetor.

Representatives: C. M. Kaltwasser, president; David Firth, vice-president; S. W. Gray, chief engineer; W. C. Pierce, regional manager; J. Storer, engineer; E. Rector, engineer, and N. M. Hurry, service sales manager.

•

MASON-NEILAN REGULATOR COMPANY
Boston, Massachusetts

Exhibiting with Maintenance Engineering Corporation.

EXHIBIT: Industrial measuring and control instruments, control valves, liquid level controllers, pressure regulators, and pneumatic transmission systems will be displayed.

Representatives: F. K. Morrison, sales manager; W. B. Rawson, sales engineer; Carl Gram, sales engineer, and C. W. Wood, sales engineer.

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McCULLOUGH TOOL COMPANY
Los Angeles, California

Booths Nos. 1546 and 1548 (Annex)

EXHIBIT: Equipment displayed will be as follows: Gun-perforators, wire line operated; rotary jars; rotary spears; casing cutters; tubing cutters; drill-pipe cutters, and fishing tools.

Representatives: O. J. McCullough, I. J. McCullough, E. S. Morrow, and H. W. Harrison.

B. F. McDONALD COMPANY
Houston, Texas

Booth No. 348

EXHIBIT: A complete line of safety equipment will be displayed, including gas masks of all types, gas detectors, protective hats, first-aid equipment, etc.

Representatives: B. F. McDonald, J. J. Delahide, M. M. McFaddin, and J. P. Repp.

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J. H. McEVOY EQUIPMENT CORPORATION
Houston, Texas

Booths Nos. 555 and 557

EXHIBIT: Equipment on display will include: McEvoy wireless well screen, McEvoy wire wrapped well screen, McEvoy gravel-packed well screen, latest type liner packers, improved set shoe assemblies, new high-pressure well heads and well control equipment both flanged type and screwed type, latest styles of Christmas trees, and McEvoy Hosmer type blowout preventers.

Representatives: J. H. McEvoy, A. Henderson, Morey Zørgdrager, and Walter Thomas.

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McKISSICK PRODUCTS CORPORATION
Tulsa, Oklahoma

Booth No. 1141 (Annex)

EXHIBIT: Displaying their line of tubing catchers, traveling blocks, quick-opening snatch blocks, tubing blocks, safety floor block, construction blocks, tubing bleeders, standing valves, safety tubing supports, Peerless floating type stuffing boxes, and Peerless all-steel load binders.

Representatives: Bill McKissick and Mr. Johnson of Tulsa, Oklahoma, and L. C. Holloway, Houston, Texas.

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McNEELY MATERIALS COMPANY
Houston, Texas

Booths Nos. 1242 and 1244 (Annex)

EXHIBIT: Exhibit will be in conjunction with Vernon Tool Company, Ltd., for which McNeeley Materials Company is Mid-Continent-Gulf Coast distributors. For details of equipment to be exhibited see under Vernon Tool Company, Ltd.

Representative: J. W. McNeely.

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MECHANICAL RUBBER COMPANY
Passaic, New Jersey

Exhibiting in Continental Supply Company section.

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GEO. S. MEPHAM CORPORATION
East St. Louis, Illinois

Booths Nos. 415 and 417

EXHIBIT: Display will consist of various drilling muds and chemicals for their treatment. Intend to display photographs of the company's new plant, which is now being erected in Texarkana for the manufacture of Colox. This plant will be the largest in the world devoted exclusively to the manufacture of drilling muds, according to officials of the company.

Representatives: L. K. Ayers, Tom Bergin, Hart Green, J. T. Patterson, Jr., E. F. Brownhill, H. E. Emmerton, Kemp Lewis, R. F. Hodder, Wiley Steen, Fred Poe, B. L. Jones, and J. A. Coulson.

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MERCO CENTRIFUGAL COMPANY
San Francisco, California

Booth No. 1048 (outside)

EXHIBIT: A new model centrifugal desander for rotary drilling mud. This machine is of a size and capacity between the Type A-20 and the Type A-30, which have been in use in the oil fields for the last decade. The new machine, although embracing the same principles of separation and operation as the older machines, is more efficient, more compact, and lighter and will be presented to the industry at a considerable saving in cost over the Type A-20, the

The Nixon Gas-Lift System

FLUID LIFTING PRACTICE
In the "World of Tomorrow"

Wilson Supply Co.

1412 Maury St. OIL & GAS WELL SUPPLIES Houston, Texas

manufacturers state, in fact, this machine is expected by them to replace both the A-20 and the A-30. The machine will be exhibited in operation.

Representative: Albert Peltzer, Jr., field engineer.

●

MERCO NORDSTROM VALVE COMPANY
San Francisco, California

See Pittsburgh Equitable Meter Company exhibit.

●

THE MERIAM COMPANY
Cleveland, Ohio

Exhibiting in W. H. Curtin and Company section.

●

MERRITT TOOL COMPANY
Kilgore, Texas

Exhibiting in Manning Oil Specialties section.

●

METAL GOODS CORPORATION
Houston, Texas
Booths Nos. 564, 664, and 665

EXHIBIT: Various non-ferrous metals distributed by the Metal Goods Corporation will be used in the construction of its booth. The availability of local stocks and technical help will be featured. Also present will be the Metal Goods Metal Man.

Representatives: Sam D. Hodgdon. Carl T. Wedemeyer, R. J. Rice. L. E. Fuller, Harris T. Gregg, H. C. Riedel, and Edward Schwartz.

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MID-CONTINENT DIESEL ENGINE EQUIPMENT MANUFACTURING COMPANY
Fort Worth, Texas

Exhibiting in Mid-Continent Supply Company section.

●

MID-CONTINENT MUD COMPANY
Houston, Texas

See Houston Oilfield Material Company, Inc., section.

●

MID-CONTINENT PUMP SUPPLY COMPANY
Tulsa, Oklahoma

Exhibiting with Mid-Continent Supply Company.

EXHIBIT: Pacific and Oil States insert and tubing type metal-to-metal pumps.

Representatives: Roy A. Dunbar, president, Mid-Continent Pump Supply Company, and Ralph Van Matre, sales manager.

●

MID-CONTINENT SUPPLY COMPANY
Fort Worth, Texas
Booths Nos. 1001 and 1002 (outside)

EXHIBIT: The following equipment will be on display:

Mid-Continent-Cummins Model M-21 V-belt mechanical rotary rig drive powered by two 225-hp. Cummins engines (one engine using Diesel fuel and the other natural gas fuel).

Mid-Continent-Cummins Diesel rotary auxiliary (utility) unit consisting of a Model "A" 4-cylinder, 25-hp. Cummins 4-cycle, full Diesel engine having electric starting, connected to line shaft by flexible coupling with separately clutched V-belt drives to: 7½-kw. generator, 2½-in. centrifugal wash-down pump, and 2-stage air compressor (for starting large engines), all mounted on pipe skid air tank base.

Cummins cold-starting full Diesel 125-hp. 6-cylinder power unit, Model HP-600, left-hand rotation having special 4-speed transmission for separate engine drive to rotary table.

Cummins cold-starting full Diesel 175-hp. 6-cylinder, supercharged engine, Model HPS-601, driving mud pump, having clutch, radiator, and fan equipment.

Cummins cold-starting full Diesel 150-hp. 6-cylinder marine engine, Model HMR-602, having marine reverse gear.

Cummins cold-starting full Diesel 35-hp. 4-cylinder engine, Model AP-400-C, driving 4½-in. by 6-in. Gardner-Denver duplex power pump, having clutch, radiator, and fan equipment.

Cummins cold-starting full Diesel 55-hp. 6-cylinder engine, Model AP-600-C, driving Emsco geared pumping unit.

Cummins cold-starting full Diesel 67-hp. 4-cylinder marine engine, Model AMR-400, having marine reverse gear.

Cummins cold-starting full Diesel 100-hp. 6-cylinder marine engine, Model AMR-600, having marine reverse gear.

Cummins cold-starting full Diesel 450-hp. 12-cylinder power unit, Model VLP-1202.

Ideco "Little Giant" drawworks, 23-in. rotary table, and 2-speed reversing countershaft.

Gardner-Denver 4½-in. by 6-in. power-driven duplex pump.

Emsco 7¼-in. by 12-in. power-driven slush pump having cast-steel fluid end, 2000-lb. working pressure, and 3000-lb. test pressure. The fabricated steel power end is equipped with roller bearings throughout.

Emsco, 7¾-in. by 16-in. power-driven slush pump having forged-steel fluid end, 3000-lb. working pressure, and 6000-lb. test pressure. The fabricated steel power end is rated 330-hp. at 55 r.p.m.

Emsco 15½-in. by 7¾-in. by 20-in. steam slush pump having forged-steel fluid end, 3000-lb. working pressure, and 6000-lb. test pressure. Considerable steam saving is effected by the cam actuated valves.

Emsco D20-TPM 4-hp. twin-crank, portable, double-reduction, roller-bearing-equipped, continuous-tooth herringbone geared pumping unit.

Emsco D40-TPM 8-hp. twin-crank, portable, double-reduction, roller-bearing-equipped, continuous-tooth herringbone geared pumping unit.

Emsco D77-TPM 15.3-hp. twin-crank, portable, double reduction, continuous-tooth herringbone geared pumping unit.

Emsco D165-TPM 33.3-hp. twin-crank, portable, double-reduction, continuous-tooth herringbone geared pumping unit.

Emsco S255-TPM 51.5-hp. twin-crank, portable, single-reduction, continuous-tooth herringbone geared pumping unit.

Pacific oil well pumps having working and cutaway models showing streamline cages and how gas is handled.

Bethlehem fully normalized A. P. I. sucker rods including a display of Bethlehem's exclusive methods of fully protecting rods for handling, loading, transporting, unloading, and stacking.

Bethlehem wire rope having Unizact core showing Bethanizing process.

Ludlow gate valves, No. 4 and No. 5½ cutaway models, and No. 5½ and No. 8 complete valves.

Mid-Continent automatic relief valves for oil pipe-line service.

Mid-Continent low air pressure surge chamber for alleviating surge in oil pipe lines.

Famous Brand cutaway specimens of rotary hose.

A. C. F. full area lubricated plug valves.

Wisconsin single-cylinder air-cooled gas-gasoline engine driving 4-hp. pumping unit.

Veelos detachable V-belting. Drives on rig utility unit and on individual well pumping unit.

Allis-Chalmers V-belt sheaves on rotating elements for drawworks drive.

Naylor Spiralweld line pipe and surface casing.

Locomotive Finished Material Company combination union and check valve, Universal piston rings, and Universal cylinders.

Mid-Continent well gas detector for detecting the presence of gas in drilling muds and to indicate the penetration of gas or other sands that will discharge gases into drilling mud.

Mid-Continent Fluoroscope for examining mud specimens and to determine the location of oil-bearing sands.

Representatives: Mid-Continent Supply Company personnel in attendance: K. W. Davis, president, Fort Worth, Texas; D. H. Thornbury, vice-president, Houston, Texas; J. A. Daugherty, vice-president, Tulsa, Oklahoma; J. C. Halbert, secretary-treasurer, Fort Worth; F. J. Spurlock, sales manager, Fort Worth; F. John, purchasing agent, Fort Worth; R. O. Moore, general merchandising manager, Fort Worth; C. D. Helm, sales engineer, Fort Worth; A. S. George, manager machinery department, Fort Worth; P. H. Edwards, sales engineer, Fort Worth; T. M. Cone, designing engineer, Fort Worth; H. H. Brown, branch manager, Dallas, Texas; A. E. LeClaire, store manager, Houma, Louisiana; H. E. Hamilton, district sales manager, Houston; W. I. West, district manager, Houston; H. McMurry, store manager, Houston; J. E. Everroad, sales engineer, Houston; L. L. Winters, Houston; A. L. Smith, sales engineer, Houston; R. E. Fuller, Houston; O. A. Schilling, Houston; S. W. Woolsey, Houston; Herbert Muery, Houston; T. W. Ratcliffe, Jr., Houston; R. C. Tucker, district manager, Odessa, Texas; T. P. Tarwater, store manager, Odessa; J. W. Hoover, sales engineer, Odessa; R. L. McAnally, store manager, Kermit, Texas; F. R. Files, store manager, Kilgore, Texas; E. H. Holcomb, sales engineer, Kilgore; G. H. Canterbury, store manager, Lake Charles, Louisiana; A. T. Skaer, store manager, Lisbon, Louisiana; C. M. Fleeman, store manager, Magnolia, Arkansas; G. A. Wead, store manager, Refugio, Texas; H. P. Moore, store manager, Rodessa, Louisiana; G. W. Walters, store manager, Seagraves, Texas; S. W. Backus, district manager, Shreveport, Louisiana; T. A. Brown, sales engineer, Shreveport, Louisiana; P. J. Dasey, sales engineer, Tulsa; C. R. Brooks, store manager, Turnertown, Texas, and W. P. Mason, store manager, Wichita Falls, Texas.

Cummins Engine Company, Columbus, Indiana, representatives: C. L. Cummins, president; J. I. Miller, general manager; P. E. Letsinger, vice-president in charge of sales; Dave Buttles, sales manager; S. W. Curtiss, advertising manager; D. B. Worth, manager, Industrial Division, and J. B. Chambers, manager Mid-Continent area, Fort Worth, Texas.

American Car and Foundry Company, New York, New York, representatives: W. R. Kottsieper, assistant sales manager Valve Department, New York, and W. C. Mooney, Dallas, Texas.

Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, representatives: Ray Enters, Texrope Division, Milwaukee; W. A. Meyer, Texrope Division, Milwaukee; O. A. Haas, district manager, Tulsa; G. H. de la Vergne, Dallas; and D. M. McCargar, Houston.

Bethlehem Steel Company, Bethlehem, Pennsylvania, representatives: J. C. Miller, manager of sales, Bethlehem; P. E. McKinney, metallurgical engineer, Bethlehem; Charles M. Ballard, Bethlehem; W. R. Shimer, Bethlehem; John J. Lovell, Tulsa; J. E. Moore, Houston; C. B. Hinton, Houston, and M. P. Leonard, Dallas.

Emsco Derrick and Equipment Company, Los Angeles, California, representatives: P. D. Browne, plant manager, Houston; L. W. Stahl, chief engineer, Houston, and George W. Walton, vice-president and manager Midco Machinery Division, Dallas.

General Electric Company, Schenectady, New York, representatives: A. H. Keen, Fort Worth; G. R. Prout, Dallas, and George Currie, Houston.

Gardner-Denver Pump Company, Quincy, Illinois, representatives: R. L. McClain, Dallas, and W. E. Shaughnessy, Dallas.

Helm Manufacturing Company, Fort Worth, Texas, representative: A. C. Helm.

Hewitt Rubber Corporation, Buffalo, New York, representative: L. D. Bigelow, vice-president, Chicago, Illinois.

International Derrick and Equipment Company, Beaumont, Texas, representatives: R. R. Bloss, president and general manager, Beaumont, and E. H. Eddleman, general sales manager, Dallas.

The Locomotive Finished Material Company, Atchison, Kansas, representatives: H. E. Muchnic, president, and A. H. Moorhead, sales manager.

The Ludlow Valve Manufacturing Company, Troy, New York, representatives: A. W. Thompson, vice-president, Troy, New York, and R. B. Trow, district manager, Houston.

Mid-Continent Pump Supply Company, Tulsa, Oklahoma, representatives: R. A. Dunbar, president, and R. Van Matre.

Manheim Manufacturing Company, Manheim, Pennsylvania, representatives: Stuart Courley, sales manager, Manheim, and Vincent K. Alexander, branch manager, Chicago.

Naylor Pipe Company, Chicago, Illinois, representatives: E. W. Naylor, vice-president, and N. E. Turney, sales manager.

Perfex Radiator Company, Milwaukee, Wisconsin, representative: G. G. Holt, vice-president in charge of sales.

Twin Disc Clutch Company, Racine, Wisconsin, representatives: G. M. Guilbert, vice-president, Racine, and J. B. Jenkins, district manager, Tulsa.

●

MINE SAFETY APPLIANCES COMPANY
Pittsburgh, Pennsylvania

Booths Nos. 313 and 315

EXHIBIT: Will have an attractive exhibit panel and a representative array of safety products. Among the more prominent products manufactured and sold by the company are hose masks and industrial canister masks, including tank gauger's masks; Comfo dust and paint respirators and the Dustfoe respirator (all U. S. Bureau of Mines-approved); Skullgard protective hats and caps; M. S. A. abrasive masks and Air Line respirators; Edison electric cap and hand lamps; gas detecting, analyzing, and recording instruments; protective clothing; and resuscitation apparatus, the H-H Inhalator.

Representatives: H. W. Richards, G. J. Gruber, H. L. Phillips, R. M. Nicholson, and P. B. Simpson.

●

MINNEAPOLIS-HONEYWELL REGULATOR COMPANY
Minneapolis, Minnesota

Exhibiting in Brown Instrument Company section.

●

MISSION MANUFACTURING COMPANY
Houston, Texas

Booths Nos. 304, 306, 405, and 407

EXHIBIT: The following equipment manufactured by the company will be on display:

Mission Rolling Dog slips, which the maker states will not cut pipe, bottleneck pipe, or stick in the slip bowl.
Mission one-piece rotary slips.
Mission two-piece rotary slips.
Mission casing slips.
Mission deep-well tubing spiders.
Mission lightweight tubing spiders.
Mission Silvertop slush pump valves.
Mission slush pump pistons.
Mission slush pump piston rods.
Mission valveless swabs.
Mission lubricated plug valves.
Mission cathead safety device.
Mission self-coiling spinning line.

Representatives: W. B. Sharp, D. C. Sharp, W. T. Campbell, J. D. Best, R. M. Garrison, E. N. Trammell, and field salesmen.

●

MODERN DISPLAY COMPANY
Houston, Texas

Balcony—Coliseum

●

MODERN ENGINEERING COMPANY
St. Louis, Missouri

Booth No. 1041-A (outside)

●

MOTOR IMPROVEMENTS, INC.
Newark, New Jersey

Booths Nos. 509 and 511

EXHIBIT: The manufacturers of Purolator, the oil filter, will have on exhibit an imposing array of fuel and lubricating oil filters for Diesel and gasoline engines of every kind. DP "absolute" type Purolators that are said to filter fuel oil so thoroughly that particles of dirt as minute as cigarette smoke are trapped and retained by this filter will be displayed in various sizes; single with replaceable elements, duplex with removable elements, and duplex in combination with metal edge elements.

D-type fuel oil filters of various designs and size for any and all installations or requirements.

Small jet filters, some only 1⅞ in. in length, for protection against scale or other contaminations harmful to the Diesel firing jets.

N-type lubricating oil filters for crankcase capacities varying from less than 5 quarts to 30 quarts and more, capable of removing even colloidal carbon discoloration from the oil.

Representatives: J. A. Graham, president; F. P. Herman, manager of equipment sales; H. B. Graham, sales engineer; T. R. Collioud, district representative; S. McCormick, sales engineer; A. Bell, engineer, and A. W. Schuller, distributor.

●

JOHN MULLER COMPANY
Houston, Texas

Booths Nos. 1335 and 1337 (Annex)
And Witte Engine Works section

●

MULTI-SEAL MANUFACTURING COMPANY
Chicago, Illinois

Exhibiting in Mid-Continent Supply Company section.

●

MURPHY DIESEL ENGINE COMPANY
Milwaukee, Wisconsin

Exhibiting in W-K-M Company section.

●

MURRAY-BROOKS HARDWARE COMPANY
Lake Charles, Louisiana

Exhibiting in Lucey Boiler and Manufacturing Corporation section.

●

MURRAY IRON WORKS COMPANY
Burlington, Iowa

Booth No. 1571 (Annex)

EXHIBIT: Following equipment to be exhibited: Mechanical-drive steam turbine with parts and a steam-turbine-driven unit heater.

Representatives: P. Schmertz, sales engineer, Burlington, Iowa, and Haylett O'Neill, local representative.

●

NATIONAL ALUMINATE CORPORATION
Chicago, Illinois

Booth No. 765

EXHIBIT: Display will consist of ways and means for proper water conditioning. Will have on display special equipment designed for proper control of treatment but will mostly confine the exhibit to methods of treatment, etc.

Representatives: E. F. Fellows, district manager; J. L. Hickman, R. S. Morcom, and Andrew O. Jaros.

●

NATIONAL CARBIDE CORPORATION
New York, New York

Exhibiting in Air-Reduction Sales Company section.

●

NATIONAL CARBON COMPANY, INC.
Cleveland, Ohio

See exhibit of Union Carbide and Carbon Corporation.

●

THE NATIONAL SUPPLY COMPANY
Toledo, Ohio

Booths Nos. 136, 140, 237, and 241

EXHIBIT: No equipment will be displayed; reception booth only.

Representatives: J. A. Geismar, vice-president and general manager; D. S. Faulkner, vice-president; L. V. Boggs, vice-president; C. C. Cartwright, vice-president; H. O. Powell, assistant to vice-president; A. W. McKinney, manager of sales; H. L. Putnam, division sales manager; J. F. Tucker, general district manager; C. A. McCollum, division manager; M. F. Cribbs, division manager; W. F. Smith, division manager, and J. R. Mahan, chief engineer.

●

NATIONAL TANK COMPANY
Tulsa, Oklahoma

Booths Nos. 252, 254, and 256

EXHIBIT: Miniature transparent crude oil emulsion treater, showing actual travel and treatment of fluids as they pass through the system of free water removal, heating, washing, settling, and automatic removal of the separate fluids.

Tank battery in miniature showing modern hookup for vapor retention equipment. Complete A.P.I. walkway in miniature.

Complete scale model National Oil and Gas Separator in ¾ section, showing interior arrangement, operation of valves, etc.

Armco surface casing.

Tite-Line couplings.

Accessories for tanks, separators, and treating systems.

Representatives: Floyd L. Senter, S. S. Parker, C. O. Relephord, James E. Ward, and Chester Immel.

●

NATIONAL TECHNICAL LABORATORIES
Pasadena, California

Exhibiting in W. H. Curtin and Company section.

●

NATIONAL TUBE COMPANY
Pittsburgh, Pennsylvania

Booths Nos. 633, 635, 637, 639, and 641

EXHIBIT: Oil country tubular goods, including National A.P.I. casing, tubing, and drill pipe.

●

NAYLOR PIPE COMPANY
Chicago, Illinois

Exhibiting with Mid-Continent Supply Company.

EXHIBIT: Equipment on display will include Naylor line pipe and Naylor surface casing.

Representatives: E. M. Naylor, vice-president, and N. E. Turney, sales manager.

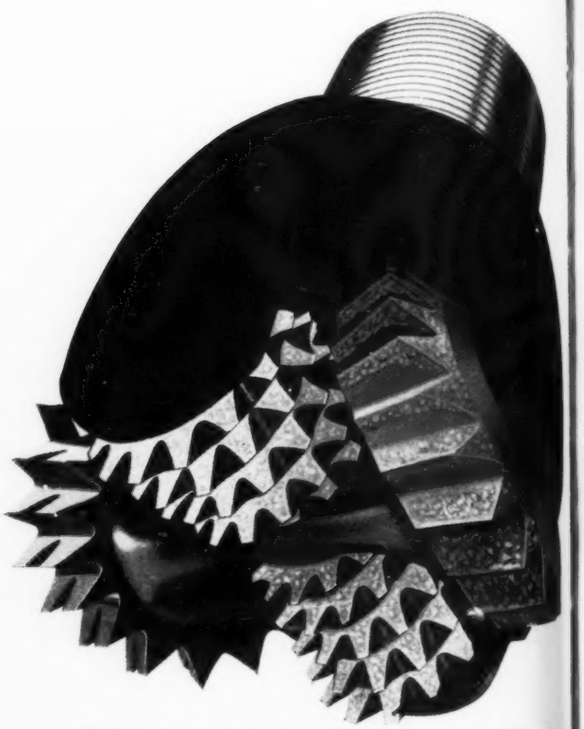
●

NEW BEDFORD CORDAGE COMPANY
New York, New York

Exhibiting in Continental Supply Company section.

REED DEPENDABILITY...

THE FIRST REQUISITE FOR PRODUCTS
USED IN THE DRILLING OF THESE WELLS
WAS DEPENDABILITY



REED DK-1 ROCK BITS
USED IN THE DRILLING OF THESE WELLS

The
REED ROLLER BIT CO.
wishes to congratulate Drilling and Explora-
tion Company and its personnel upon their
accomplishments in the drilling of these wells

REED FULL HOLE TOOL JOINTS
USED IN THE DRILLING OF THESE WELLS

WHEREVER THERE IS ROTARY DRILLING YOU WILL FIND
REED PRODUCTS "GETTING THE JOB DONE"

. . . IN THE JUNGLES OF PERU

A SHIPMENT OF

REED ROCK BITS

BY AIR EXPRESS

FOR DRILLING AND EXPLORATION CO.'S
AGUA CALIENTE No. 1

TRANS-SHIPPED FROM LIMA, PERU, TO LOCATION

Loading 10—8½" hard formation Reed Rock Bits on the plane in Los Angeles.

Unloading in Lima, Peru, 3½ days after order was received.

REED
BR WIRE LINE DRILLING-CORING BIT USED IN THE DRILLING OF THESE WELLS

REED ROLLER BIT COMPANY

NILES STEEL PRODUCTS DIVISION REPUBLIC STEEL CORPORATION
Niles, Ohio

Exhibiting in Republic Steel Corporation section.

•

NIXDORFF-KREIN MANUFACTURING COMPANY
St. Louis, Missouri

Booth No. 1576 (Annex)

EXHIBIT: Will display welded chains consisting of boomer chains, steel loading chain, tire chains, mud chains, tire chain accessories, grab hooks, cold shuts, and a complete line of Elephant brand chains.

Representatives: E. Littmann, Ben Sander, W. E. Dorman, H. D. Whitley, G. K. Morgan, and F. R. Eyer.

•

NORMA-HOFFMANN BEARINGS CORPORATION
Stamford, Connecticut

Booth No. 1408 (Annex)

EXHIBIT: Will display a complete line of precision ball, roller, and thrust bearings, featuring the Cartridge-type, self-sealed, single-row ball bearing, which is particularly adaptable for application to electrical equipment, including motors and generators.

Will also exhibit a complete line of extra-light-weight ball and roller bearings, particularly adaptable to clutches, clutch sprockets, and idler gears, where space limitations are paramount.

There will also be exhibited cylindrical roller bearings, single-row and self-aligning ball bearings adaptable to a wide variety of applications on oil-field equipment; numerous types and sizes of ball and roller bearing pillow blocks, and a complete range of smaller sizes of bearings, many of them equipped with single and double seals suitable for instrument work.

Representatives: D. E. Christopher, Chicago sales representaative, and Warren Anderson, engineering department.

•

W. C. NORRIS, MANUFACTURER, INC.
Tulsa, Oklahoma

Booths Nos. 652 and 654

EXHIBIT: A general line of pumping equipment of all kind will be displayed, as well as a unique merry-go-round of swaged nipples and bull plugs.

Representatives: W. C. Norris, president; D. S. Bowers, vice-president and general manager; J. H. Eustice, sales manager; Henry H. Paris, branch manager, and Arthur J. Urban, salesman.

•

NORVELL-WILDER SUPPLY COMPANY
Beaumont, Texas

Booths Nos. 104, 106, 108, 110, 112, 114, 116, 118, 120, 205, 207, 209, 211, 213, 215, 217, 219, and 221

Representatives: Representatives from all the eight Norvell-Wilder stores and the company's two offices will be present at various times.

•

OAKITE PRODUCTS, INC.
New York, New York

Booths Nos. 1308 and 1310 (Annex)

EXHIBIT: A dioramic presentation of the principal cleaning operations required in the producing, refining, and marketing divisions of the oil industry. One highlight will be a miniature cut-away model of a storage tank showing how paint is stripped from the exterior by the patented Oakite Hot Flow-On Method, and how interior surfaces are cleaned. New and improved materials for removing hard water scale and rust accumulations, carbonaceous oil, and grease deposits from heat exchange equipment will be displayed.

The Hot Flow-On Method is an advanced mechanical method whereby utilizing a water solution eliminates fire and silicosis hazards in stripping paint from storage tanks, tank cars, and automotive equipment.

Oakite Compound No. 32 is a specialized material designed to effect fast, safe removal of rust and scale deposits from Diesel water jackets and radiators, air compressors, and other water-cooled or water circulating equipment.

Oakite Composition No. 9 is an oil soluble emulsifier especially developed for removing sludge and many types of carbonaceous oil and grease deposits from Diesel crank cases, oil coolers, preheaters, and similar heat exchange equipment.

Representatives: George Seib, New York; J. C. Leonard, Chicago and southwestern division manager; A. W. Schulte, Dallas representative; William A. Dowen, Houston representative, and J. R. Whyte, Tulsa and Oklahoma City representative.

•

OCEANIC ENGINEERING WORKS
Houston, Texas

Booth No. 1008 (outside)

EXHIBIT: Equipment of the Oceanic Engineering Works and the Hutchison Engineering Works, Chicago, will be displayed jointly, and will include the following: turbine-driven generator sets, gasoline-engine-powered electric light plants, steam turbines, floodlights, electric motors, sand separator, and shale shaker.

Representatives: Leon Hart, Jacklyn Foster, Eco Hutchison, and Frank E. Hutchison.

•

THE O. C. S. MANUFACTURING COMPANY
Coffeyville, Kansas

Booths Nos. 1413 and 1415 (Annex)

EXHIBIT: The OCS 5-hp. double-reduction pumping unit is a miniature of all OCS Polly-type pumping units. It is identical in design and all parts are machined with the same accuracy and the same quality as the larger sizes to 100 hp., it is stated. The one difference in principle of this unit is that it is provided with both a centrifugal and beam balance. This combination balance for a small size unit provides the unit with the advantage of the centrifugal balance and the advantage of a beam balance. This machine makes the unit pumping of oil wells competitive with powers, and also gives the advantage of individual well operation, the makers state. The efficiency of roller bearings and roller chain provides this unit with high efficiency and assures low power cost, the manufacturers assert.

Representatives: D. R. Brown, D. C. Myers, C. B. Morton, A. G. Evans-Lombe, Fred Stanley, R. J. Hansen, Ben Palamountain, Joe Kilchenstein, Tom Scott, Melvin L. Dick, and Jack Ross.

•

OIL CENTER TOOL COMPANY, INC.
Houston, Texas

Booths Nos. 400, 401, 402, and 1049

EXHIBIT: Display will include blowout preventers, casingheads, bradenheads, tubingheads, adjustable and quick change chokes, Christmas trees, air-balance pumping unit, needle valve chokes, and forged-steel high-pressure fittings.

Representatives: A. J. Penick, president; K. T. Penick, secretary-treasurer; B. V. Fisher, vice-president and sales manager; H. D. Start, vice-president; Val R. Wittich, Jr., foreign sales representative; Paul Baimbridge, sales representative; Walter Burke, sales representative; C. J. Hillman, sales representative; C. K. Mount, sales representative; I. C. Wells, sales representative; H. C. Stewart, sales representative; H. S. Perry, sales representative, and J. E. Edwards, sales representative.

OIL CITY BRASS WORKS
Beaumont, Texas

Booths Nos. 1236 and 1238 (Annex)

EXHIBIT: Will display Red-Rex pipe unions and Bronzoid bearing metal and bearings manufactured therefrom.

Representatives: George E. Bryant, Jr., B. D. Todd, L. H. Kennon, and R. J. Loucks.

•

OIL FIELD MACHINE AND SUPPLY COMPANY
Houston, Texas

Booth No. 1065-A (outside)

EXHIBIT: Are co-exhibitors with Tuboscope, internal tubular inspection service. Principal item of equipment to be exhibited is the Tuboscope, an optical instrument designed for internal inspection of oilfield tubular goods, such as drill pipe, drill collars, and kellys, under low power magnification. The instrument consists of an illuminating device, a wide-angle objective lens, and a series of intermediate lenses placed serially in tubes, through which the primary image is transmitted to an eyepiece outside the article being inspected. By means of this instrument an operator can examine minutely the entire internal surface of tubular goods, locating cracks or flaws that may be present, and studying the effects of fluid wear and corrosion, the manufacturers state.

Representatives: Fritz Huntsinger, owner of Tuboscope; W. H. Hopkins, operator of Tuboscope; E. K. Lane, president, Oilfield Machine and Supply Company; M. M. Verheul, secretary-treasurer, Oilfield Machine and Supply Company, and D. P. Tarpenning, sales representative, Oilfield Machine and Supply Company.

•

OILPURE REFINER COMPANY
Glendale, California

Exhibiting with Jno. Muller Company.

EXHIBIT: Equipment on display will be five models of Oilpure Refiners, including three new models coming out in March of this year.

Representative: C. V. Hollis.

•

OIL WELL SUPPLY COMPANY
Dallas, Texas

Booths Nos. 532, 534, 536, 538, and 540

EXHIBIT: Interesting photographic presentation of design and application of modern oilfield equipment.

Representatives: Will be represented at the exposition by the company's Houston representatives.

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OIL WELL SURVEY INSTRUMENT COMPANY
Houston, Texas

Exhibiting in Manning Oil Specialties section.

•

OKADEE COMPANY
Chicago, Illinois

Exhibiting in Well Equipment Manufacturing Corporation section.

•

OLYMPIC PRODUCTS COMPANY
Successor to
Olympic Engineering Corporation and Olympic Rubber Company
Los Angeles, California, and Houston, Texas

Booth No. 254

•

OSHMAN OUTDOOR STORE
Houston, Texas

Booth No. 249

EXHIBIT: Outdoor clothing of all types for the oil man.

Representatives: C. L. Keith, G. B. (Skelly) Skelton, and C. L. Bering.

THE OSTER MANUFACTURING COMPANY
Cleveland, Ohio

Booths Nos. 716, 718, 720, and 722

EXHIBIT: The following equipment will be displayed:

No. 8-XHD Williams Rapiduction heavy-duty oil field threading machine.

No. 542 Rapiduction Junior threading machine.

No. 562 Tom Thumb portable pipe machine.

No. 422 Oster power vise stand.

No. 825 chaser grinder.

An assortment of hand die-stocks.

Representatives: A. S. Gould, vice-president; H. C. Gardner, southwest district manager; P. E. Willis, Pacific Coast district manager; Stanley Piascik, general foreman; L. M. Gardner, district representative, and Henry Zuerl, machine operator.

•

OTIS PRESSURE CONTROL, INC.
Dallas, Texas

Booths Nos. 1314 and 1316 (Annex)

EXHIBIT: Display will consist of Otis snubbers, Otis square kelly pressure control drilling equipment, Otis removable bottom-hole chokes, Otis Type G (side door) removable bottom-hole choke, Otis removable bottom-hole regulator, Otis removable tubing safety valve, Otis paraffin scrapers, and Otis tubing closing tools.

Representatives: I. A. Miller, and L. M. Wilhoit.

•

PACIFIC PUMP WORKS
Huntington Park, California

Exhibiting in Mid-Continent Supply Company section.

•

PACKING ENGINEERING CORPORATION
Cranford, New Jersey

Exhibiting with J. E. Young.

•

HENRY H. PARIS
Houston, Texas

Booths Nos. 650, 652, and 654

EXHIBIT: Equipment of W. C. Norris, Manufacturer, Inc., and Wheeling Machine Products Company, for which Henry H. Paris is distributor, will be displayed.

•

THE PARKERSBURG RIG AND REEL COMPANY
Parkersburg, West Virginia

Booths Nos. 1300 and 1303 (Annex)

EXHIBIT: Motor-driven pumping unit models will be displayed.

Representatives: John M. Crawford, Paul L. Brooks, V. E. Ashford, and Casper A. Ruf.

•

PATTERSON-BALLAGH CORPORATION
Los Angeles, California

Booths Nos. 132 and 134

EXHIBIT: Will have on display the Patterson-Ballagh casing protectors, stabilizers, open-hole drill-pipe protectors, the Patterson-Ballagh swivel bumper, the Patterson-Ballagh mud gun, Patterson-Ballagh mud wiper, and the McQuiston portable break flange grinder.

Representatives: J. C. Ballagh, J. M. O'Melveny, H. C. Armington, and A. F. McQuiston.

•

PEERLESS MANUFACTURING COMPANY
Dallas, Texas

Booth No. 1511 (Annex)

EXHIBIT: Equipment displayed will include Peerless mist extractors and line separators; Peerless gas well separators, particularly designed for high-pressure gas wells producing distillate or relatively small quantities of oil; Peerless odorizers for odorizing natural gas, and Nicholson gasoline traps.

Representative: E. W. Smith, manager.

•

PEERLESS PUMP DIVISION FOOD MACHINERY CORPORATION
Los Angeles, California

Exhibiting with M. N. Dannenbaum Company.

•

PEORIA SAND BLAST MANUFACTURING COMPANY
Peoria, Illinois

Exhibiting in Egner Brothers section.

•

PERFEX CORPORATION
Milwaukee, Wisconsin

Exhibiting with Mid-Continent Supply Company.

•

THE PERMUTIT COMPANY
New York, New York

Booth No. 1341 (Annex)

EXHIBIT: Equipment to be shown will include the company's new portable Zeolite water softener rig for treating boiler waters for well-drilling equipment. Literature and photoblowups will describe Zeo-Karb—the hydrogen zeolite treatment, Permutit cold and hot lime soda methods of water softening, as well as chemical feeds, Floc-formers, and other new and improved devices. Also on display will be the new automatic household softening unit.

Representatives: J. A. Rossiter and J. P. Jeter.

•

THE PETROLEUM ELECTRIC POWER CLUB
Houston, Texas

Booths Nos. 9, 10, and 11

EXHIBIT: Display of electric motors and associated apparatus used in petroleum industry.

Representatives: F. M. Austin, O. W. Jones, E. L. Robinson, R. E. Hendricks, Walter Moore, and K. K. Kreamer.

•

THE PETROLEUM ENGINEER
Dallas, Texas

Booths Nos. 218 and 220

EXHIBIT: Exhibiting *The Petroleum Engineer*, a magazine of methods for operating men. Copies of the publication will be available, as well as special binders for filing editorial matter.

Representatives: C. Morris, president; K. C. Sclater, editor; Frank H. Love, managing editor; H. Lee Flood, associate editor; T. J. Crowley, vice-president; C. R. Barrett, circulation manager, and Axe Jones, advertising representative.

•

PETTIBONE MULLIKEN CORPORATION
Chicago, Illinois

Booth No. 1584 (Annex)

EXHIBIT: Several improved designs of manganese steel drilling and A.P.I. production sheaves, and various applications of PMCo Diamond Alloy.

Diamond Alloy, a PMCo development, is recommended by the company for applications requiring continued and extreme resistance to abrasion. It has a tensile strength of 75,000 psi and a Brinnel hardness of 670-700 The applications for which it is particularly recommended are slush pump liners, swivel wash pipes, cores for well head (blowout perventers), and ball seats. Several liners and other applications of this alloy will be on exhibit in our booth.

Representatives: The booth will be in charge of the Mid-Continent representative, C. Kenneth Smullen of Fort Worth, Texas. From the Chicago office E. J. Seifert, vice-president; W. Enstrom, vice-president and plant superintendent, and J. P. Murtaugh, sales manager will attend.

•

PHILADELPHIA STEEL AND IRON COMPANY
Conshohocken, Pennsylvania

Exhibiting in Maintenance Engineering Corporation section.

•

PITTSBURGH EQUITABLE METER COMPANY
MERCO NORDSTROM VALVE COMPANY
Pittsburgh, Pennsylvania — San Francisco, California

Booths Nos. 335 and 337

EXHIBIT: Equipment on display will be as follows:

Nordstrom lubricated plug valves (both round opening and regular type in pressures to 10,000 lb. test).

Emco forged-steel orifice meter.

Pittsburgh Rotocycle meter (for the measurement of pipe line crude oil and other gasoline and oil metering problems).

Stupakoff bottom-hole pressure gauge.

Imo water meter.

Representatives: A. J. Kerr, district manager, Tulsa, Oklahoma; W. R. McLaughlin, Dallas, Texas; M. D. Gilbert, Houston, Texas; C. K. Madison, Houston, and E. P. Martin, Corpus Christi, Texas.

•

PITTSBURGH STEEL COMPANY
Pittsburgh, Pennsylvania

Booths Nos. 1114 and 1116 (Annex)

EXHIBIT: Equipment exhibited will include Pittsburgh Special Acme-thread casing, the quick-stabbing, fast-running casing with the double seal joint; Pittsburgh Special drill pipe with the extra-strength double-grip joint; a display of Pittsburgh Steel Company's new hydrostatic tension testing of casing, the method that matches field conditions; Pittsburgh Special double-seal oil-well tubing; Pittsburgh seamless regular A.P.I. casing, drill pipe and oil-well tubing, and Pittsburgh seamless plunger-lift tubing.

Representatives: E. J. Protin, assistant manager Tube Division; Elmer T. Wible, advertising manager; A. S. Vandervoort, Jr., district sales manager, Houston, Texas; S. E. Elder, district sales manager, Tulsa, Oklahoma; Paul R. King, sales representative; G. W. Novak, field engineer; J. Wais, Jr., field engineer; W. B. Baylor, field engineer, and R. G. McIlroy.

•

PLOMB TOOL COMPANY
Los Angeles, California

Booths Nos. 1570 and 1572 (Annex)

EXHIBIT: Oil country box wrenches, spud wrenches, end wrenches, socket wrenches and ratchets, screwdrivers, cold chisels, punches, pry bars, and a complete line of hand tools.

Representatives: Don V. Scofield, Ray C. Ricke, and A. A. Freund.

•

POMONA PUMP COMPANY
Pomona, California

Exhibiting in Southern Engine and Pump Company section.

PORTABLE RIG COMPANY, INC.
Houston, Texas

Booths Nos. 1043 and 1044 (outside) and in Texas Iron Works section

EXHIBIT: Unitized portable rigs will be shown in operation. Waukesha engines and utility units also will be displayed.

Representatives: L. D. Cain, V. R. Wittich, E. R. Poole, and others.

●

PORTER-CABLE MACHINE COMPANY
Syracuse, New York

Exhibiting in Egner Brothers section.

●

THE WM. POWELL COMPANY
Cincinnati, Ohio

Booths Nos. 331 and 333

EXHIBIT: Complete line of bronze, iron, steel, and malleable iron valves especially adapted for oil well and refinery service will be displayed. Included will be gate, globe, angle, check, manifold, and test gate valves, and mechanical-lift plug cocks. Also exhibiting high-pressure and high-temperature motor-operated valves for polymerization plants.

Representatives: E. K. Pierce, James Coombe, and William Heilig.

●

POWELL PRESSED STEEL COMPANY
Hubbard, Ohio

Booth No. 1581 (Annex)

EXHIBIT: Display will include lift-truck platforms, standard tiering boxes, extra heavy-duty Crane tiering welded box platform, and Design 105 Powell pallets for fork-lift trucks.

Representatives: H. S. Wylde, vice-president, Hubbard, Ohio, and C. G. Forshey, Houston, Texas, local representative.

●

POWERLITE SWITCHBOARD COMPANY
Cleveland, Ohio

Exhibiting in Mid-Continent Supply Company section.

●

PRATT AND WHITNEY
Division Niles-Bement Pond Company
Hartford, Connecticut

Booths Nos. 1538 and 1540 (Annex)

EXHIBIT: Thread gauges for A.P.I. casing, tubing, line pipe, drill pipe, sucker rod, and tool joints.

Precision measuring equipment, including measuring machine, supermicrometer, electrolimit comparators, size blocks, and miscellaneous standard gauges.

Small tools including reamers, taps, hobs, and dies.

Representatives: R. E. Laffler, L. E. Schultz, and S. G. Johnson.

●

PRECISION SCIENTIFIC COMPANY
Chicago, Illinois

Exhibiting in W. H. Curtin and Company section.

●

PRODUCTIVE EQUIPMENT CORPORATON
Chicago, Illinois

Booth No. 155

EXHIBIT: Selectro Vibrating Screen for screening rotary mud.

Representatives: L. E. Soldan, chief engineer, and G. J. McLernon, sales representative.

●

PYLE-NATIONAL COMPANY
Chicago, Illinois

Exhibiting with Bettis Sales Company.

●

THE PYRENE MANUFACTURING COMPANY
Newark, New Jersey

Booth No. 501

EXHIBIT: New and improved fire extinguishers will be featured. These will be in addition to the standard line of Pyrene vaporizing liquid soda-acid, foam, antifreeze, and water type fire extinguishers, a complete line of Pyrene standard, extra heavy, and "double-duty" bar-reinforced tire chains, accessories, and the Mogul tractor tire chain.

Two seamless drawn shell extinguishers known as the Guardene soda-acid type and Phomene foam type extinguishers, will be shown for the first time.

A Pyrene 2-quart vaporizing liquid extinguisher discharged by stored air pressure, which may now be renewed by an attached pump as well as by connection with a service air line, will also be shown.

A larger size Phomaire Play Pipe, foam-making water nozzle, which produces 500 to 750 gal. of fire-smothering foam per minute by an entirely new method also will be on exhibit.

Representatives: J. P. Maloney, general field sales manager; W. L. Ferrier, Chicago district manager; B. S. Allen, Dan Butler, and B. F. Covington, sales representatives.

●

THE RAGSDALE COMPANY
San Angelo, Texas

Exhibiting in Witte Engine Works section.

●

RAILWAY EXPRESS COMPANY
Booth: Balcony Coliseum

●

J. P. RATIGAN
Los Angeles, California

Booth No. 1312 (Annex)

EXHIBIT: Regular pumping equipment, such as polished-rod grips, oil-less beam hangers, walking beam rockers, pitman stirrup rockers, tubing tongs, sucker rod wrenches, sucker rod elevators, sucker rod hangers, "C" and swivel links, bell nipples, sucker rod hooks, rod line weights, shock absorbers, tubing block clamps, and stringing-up links.

In addition, shall have tools of recent manufacture and design. No. 152 equalizing tubing tong was designed to wrap around the tubing with increased efficiency. No. 144 combination bell nipple has four features, being a rod wiper or rod stripper, has a shock absorbing feature, bell nipple feature, and a packing-off feature. No. 142 stringing-up link, having a babbitt socket and a body composing its two parts. The pivotal bail on this body can be connected to a dead man, or the becket of the block. The babbitt socket will accommodate any size to and including 1⅛-in. cable.

Representatives: J. P. Ratigan; factory representatives for the New Mexico, Texas, Louisiana, and Arkansas districts, J. J. Cave and L. W. Henshaw; and representatives for Oklahoma, Kansas, Illinois, and Michigan districts, C. J. Ratigan and G. M. Seybold.

●

READING-PRATT AND CADY DIVISION OF AMERICAN CHAIN AND CABLE COMPANY, INC.
Bridgeport, Connecticut

Exhibiting with American Chain and Cable Company, Inc.

●

REAL FIRE BURNER COMPANY
Houston, Texas

Exhibiting in Well Equipment Manufacturing Corporation section.

●

RECTOR WELL EQUIPMENT COMPANY, INC.
Fort Worth, Texas

Booth No. 12

EXHIBIT: All types of Rectorheads, including three high-pressure types, will be displayed. Also display Rectorseal Thread Filler, and if possible, will have a hydraulic pump and make tests with damaged connections. The company is introducing a product known as Rectorseal Tank Coat, and this product also will be displayed in a suitable manner.

Representatives: C. L. Cron, division manager, Houston, Texas; J. T. McAdams, Jr., southern Louisiana representative; L. D. Hilton, sales manager; W. P. Knight, West Texas representative; M. L. Jackson, Shreveport and northern Arkansas representative; E. W. Brockman, Oklahoma and Kansas representative, and L. L. Rector.

●

REDA PUMP COMPANY
Bartlesville, Oklahoma

Booths Nos. 1528 and 1530 (Annex)

EXHIBIT: Reda electrical centrifugal submergible oil-well pumps.

Representatives: A. Arutunoff, P. E. Loye, Bert Sutton, Jr., F. Rees Flint, and J. O. Wise.

●

REED ROLLER BIT COMPANY
Houston, Texas

Booths Nos. 1007 and 1012 (outside)

EXHIBIT: The following equipment will be displayed:

Three standard types of DK rock bits, the DK 1, DK 2, DK 3, each with various cutter assemblies found to drill certain formations most efficiently. These assemblies are balanced for smooth running and straight drilling and are the results of extensive research and tests in fields throughout the world.

The balanced cross roller design of Reed DK rock bits cause the cutter teeth to twist and tear the formation as they penetrate, permitting the lighter drilling weights and faster rotary speeds. The unitized construction gives a great factor of safety, especially in the use of heavier weights for drilling the harder formations, and improvements in slush tube design assure positive circulation on the cutter teeth and on the bottom of the hole.

Two recent additions to the line are the DK 1T and the DK 1L. The DK 1T has been especially designed for the long 100 percent shale breaks that might be termed semi-fishtail digging. This bit has exceptionally long, widely spaced teeth that are designed to prevent balling or gumming, even in the very sticky formations.

The DK 1L has been designed for the harder limes that are not extremely abrasive and is recommended by the makers for broken formations that contain an equal amount of shale and lime.

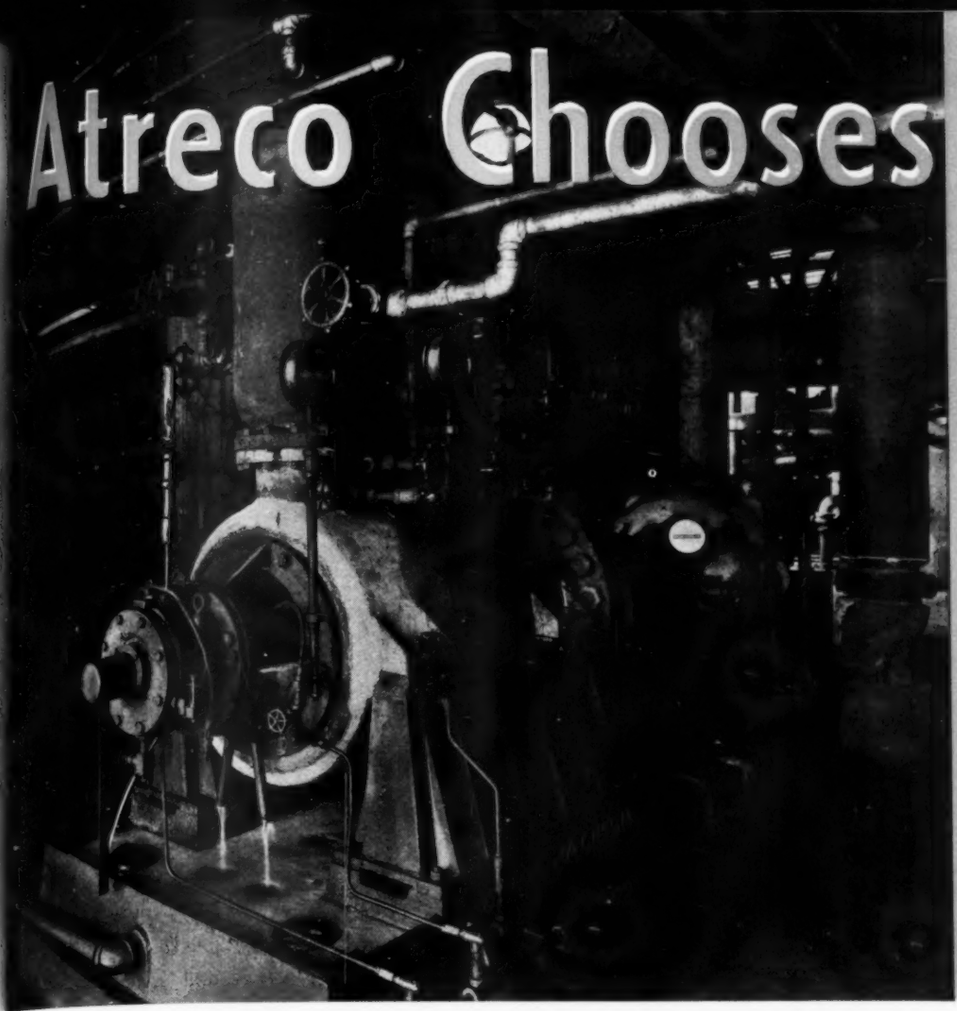
A comparatively recent addition to Reed's line of tool joints is the Reed Double Streamline Tool Joint. It has been designed as an improvement over external flush tool joints for pressure drilling and drilling with controlled circulation and for slim-hole exploration.

Reed Double Streamline Tool Joints have less increase in diameter over the pipe, and a larger diameter pipe can be used with the same hole clearance at the joint, which gives more fluid capacity down the drilling string than internal flush tool joints of the same outside diameter and more velocity in returns than internal flush tool joints of the same outside diameter, the manufacturers assert.

The Reed Rotary Reamer, equipped with improved spiral reamer cutters will be shown.

The Reed Kor-King Core Drill. Improvements have been made in the combination spring and toggle type core catcher, the new pilot type soft formation cutter head, and in the non-rotating inner barrel that operates against oil-proof, slush-lubricated robber bearings, and eliminates bearing adjustments and frequent replacements. The inner barrel is also plated against rust,

Atreco Chooses Eight OF THESE BYRON JACKSON PUMPS



IN A PLANT as modern and efficient as the ATRECO REFINERY you would naturally expect to find BYRON JACKSON PUMPS. Pictured here are several of the 33 Byron Jackson Pumps at Atreco — every pump "engineered" to perform a specific service, and meeting or exceeding every specification.

This Byron Jackson Double Case Hot Oil Pump (left) is in Recycle Charging Service, pumping 493 g.p.m. of 700 degree F. oil against 1,000 pound discharge pressure (3250-foot pumping head).

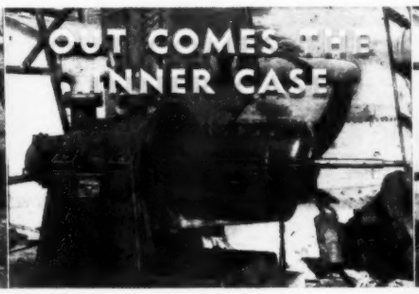
BYRON JACKSON DOUBLE CASE HOT OIL CHARGING PUMPS

These pumps have gained the favor of operators because they can be so easily dismantled and reassembled in the field, without disturbing piping or drivers, and with no necessity for field work upon the Rotating Element. See illustrations below.

Engineers approve them because of the simple design which provides also perfect hydraulic balance without using any so-called balancing devices that inevitably wear and cease to function, thus throwing heavy loads upon the thrust bearings.

BYRON JACKSON CO.
Dept. O-510
Factories at:
Berkeley and Los Angeles, California; Bethlehem, Pennsylvania.
Sales Offices at:
New York — Pittsburgh — Chicago — Atlanta — Houston — Salt Lake City.

With simple minor bearing parts removed, and End Cover with Bearing Housing being removed. Neither the Piping nor the Driver has been disconnected or disturbed. The Dismantling Tray in foreground will be found in position in views at right.



The Dismantling Tray is bolted in position supporting the Inner Volute Case and Rotating Assembly here being removed as a single unit. In spite of the large amount of coke present, the Inner Volute Case is easily removed due to the irregular sections which permit breaking away the coke. The Byron Jackson design eliminates close clearance points which cause binding.

Byron Jackson Double Case Hot Oil Charging Pumps have the inner case split horizontally along the shaft centerline. Both halves of the case are easily withdrawn from the Outer Barrel because of the irregular section with no close fits to become solidly "coked up" in service.

. . . bring on that spare assembly! The Rotating Assembly is easily removed as an assembled unit. Any necessary repairs to wearing parts are made in the machine shop, and not in the field where conditions for work of this nature never can be the best. . . . The spare Rotating Element is simply dropped into position and the pump re-assembled, with down time and repair expense reduced to a minimum.

Established 1872

BYRON JACKSON

CENTRIFUGAL PUMPS FOR EVERY SERVICE

allowing free entry and extraction of the core.

The Reed Non-Lubricated Plug Valve has been continually improved since its introduction and a Neoprene-lined mud valve added to the line. This valve will turn freely and seal fully under all conditions without the need of lubrication of any kind, it is stated.

The Reed Back-Pressure Valve consists of two pieces: a special sub manufactured to the same rigid specifications as are Reed tool joints, and a regular dart carrying a packing ring. The valve sub is placed between the pin and box of any tool joint, and the pin end of the tool joint forms the seating member for the dart. The regular dart requires the reverse movement of a viscous fluid to seal. When the Reed Back-Pressure Valve is required to seal against a drilling fluid of low viscosity, a spring dart is provided that will close mechanically in the tool joint pin in which the valve is screwed.

When pulling drill pipe, the first warning of an impending blowout often is when a stand is broken out and the drilling fluid is found to be rising with the pipe. With a Reed Inside Blowout Preventer conveniently at hand on the derrick floor this condition can be easily handled, the makers assert. The preventer can be quickly placed in the broken connection while the outside blowout preventer is being closed. The stand already hanging from the elevators can then be made up and the drill pipe run back into the hole to establish circulation below the point of trouble.

During the last year important changes have been made in the Reed BR Wire Line Outfit. The new driver has larger slush openings for increased fluid volume to meet the requirements of the larger pumps and higher steam pressures in use today. The cutter heads have been improved to reduce the burning of cores and give increased footage. New core catchers have greatly improved recovery in all formations and a new core barrel lifting ring and release plate has been designed for greater ease of handling and an added factor of safety.

Additional equipment on display will include Reed WIB (welded-in) blade drilling bits, Reed SIH wire line coring-drilling outfits, Reed air-balanced pumping units, and Reed rotary engines.

Representatives: S. P. Farish, president; W. L. Childs, vice-president and general manager; R. G. Hamaker, vice-president and sales manager; L. T. Anderson, BR department manager; Dr. J. V. Pennington, works manager; George Harrinton, chief engineer; T. J. Stancliff, assistant chief engineer; F. C. Gignoux, research engineer; C. J. Fontaine, manager sales office; Alex Feild, pumping unit manager; Charles Pirtle, pumping unit salesman; C. F. Johnson, valve division; Nathan Janco, engine division; W. J. Nutto, foreign representative (South American representative); F. Harold Gray, foreign representative (Europe); John Robinson, manager, division 50; John Hoffoss, core drilling engineer; Creighton Stokes, sales engineer; Eddie Chiles, rock bit engineer, and Alex Vallance, pumping unit division.

●

REGAN FORGE AND ENGINEERING COMPANY

San Pedro, California

Booths Nos. 404, 406, 505, and 507

EXHIBIT: To display the following equipment: 121-in., 6-sheave traveling block; 7-sheave, Type E.H., 600-ton crown block; 10¾-in. Type K blowout preventer having 6000-lb. test housing; modern casinghead equipment, and new 300-ton combination casing hook.

Representatives: From California office: Thomas J. Regan, president and general manager; C. M. Fuller, executive vice-president, and B S. Minor, production manager. From the Mid-Continent office: W. S. Proctor, manager of Mid-Continent Division; Ed Kirby, field representative, and Leo Dowse, field representative.

●

RELIANCE REGULATOR CORPORATION

Alhambra, California

Exhibiting with Westcott and Greis, Inc.

●

REPUBLIC STEEL CORPORATION

Cleveland, Ohio

Booths Nos. 125, 127, 129, 131, 133, 135, 137, and 139

EXHIBIT: Republic products featured will include line pipe tubing and casing; alloy-steel products of interest to the petroleum industry; Enduro Stainless Steel products; oil containers fabricated by the Niles Steel Products Division; shafting from the Union Drawn Steel Division; boiler tubes, mechanical tubing, and stainless steel tubing from Steel and Tubes, Inc., Republic subsidiary; bolts, nuts, and studs from the Bolt and Nut Division.

Representatives: J. M. Schlendorf, W. M. Neckerman, J. E. Holmes, G. F. Hess, C. W. East, Hoyle Jones, R. J. Working, Giles Locke, J. A. Ireland, E. B. Kelly, I. W. Whitehouse, and C. W. Ruth.

●

RHEEM MANUFACTURING COMPANY

Richmond, California

Booth No. 1326 (Annex)

●

RIDGE TOOL COMPANY

Elyria, Ohio

Booths Nos. 644 and 646

EXHIBIT: Complete line of pipe tools, including Genuine Ridgid heavy-duty pipe wrenches, in both the straight and offset patterns; compound leverage wrenches; pipe threaders for capacities ⅛ in. to 2 in.; Ridgid pipe cutters; copper tubing cutters; pipe vises; thread cutting oil and LonGrip extractors.

Representatives: W. L. Parcell, sales manager; R. C. Chamberlin, Mid-Continent representative, and James B. Graham.

●

ROBINSON ORIFICE FITTING COMPANY

Los Angeles, California

See exhibit of Westcott and Greis, Inc.

●

ROCKWOOD MANUFACTURING COMPANY

Indianapolis, Indiana

Exhibiting in Mid-Continent Supply Company section.

●

RODGERS HYDRAULIC INCORPORATED

Minneapolis, Minnesota

Booths Nos. 1404, 1406, 1505, and 1507 (Annex)

EXHIBIT: Portable hand press equipment in the 100 and 150 ton sizes, also hand- and power-operated portable track servicing equipment for servicing crawler-type tractors.

Representatives: George A. Rodgers, vice-president; J. S. Rodgers, secretary, and J. G. Murphy, sales manager.

●

ROLLER BEARING COMPANY OF AMERICA

Trenton, New Jersey

Booth No. 1556 (Annex)

EXHIBIT: Display will consist of a background of large photographs illustrating a cross-section of R. B. C.'s latest development needle type bearing marketed under the trade name of Cyclops Bearing. Will also have sample bearings, rollers, and race sections of standard 20th Century and R. B. C. type bearings.

Representatives: Raymond E. Trainer, president; E. C. Gainsborg, sales manager; George J. Fix, Sr., and George J. Fix, Jr., R. B. C. representatives in Texas.

●

J. A. ROSSITER COMPANY

Houston, Texas

Exhibiting in The Permutit Company section.

●

WALTER RUSKA AND COMPANY, INC.

Houston, Texas

Booths Nos. 141-A and 141-D

EXHIBIT: The following products will be on display: Amplifiers, bottom-hole samplers, flowmeters, galvanometers, mercury pumps, microscopes, optics, surveying instruments, permeability instruments, porosity instruments, precision chokes, flow beans, oscillographs, seismographs, recorders, and radio equipment.

Representatives: W. E. A. Ruska, president; Mrs. Helen Greening, secretary, and Mrs. W. A. Gardner.

●

SCHLUMBERGER WELL SURVEYING CORPORATION

Houston, Texas

Booths Nos. 117, 119, 121, and 123

EXHIBIT: New automatic recorder, new gun-perforators, and side-wall sampler will be displayed.

Representatives: J. L. Mathieu, G. H. Murray, and W. A. Clark.

●

SCHRAMM, INC.

West Chester, Pennsylvania

Exhibiting in Egner Brothers section.

●

SCINTILLA MAGNETO DIVISION OF BENDIX AVIATION CORPORATON

Sidney, New York

Booths Nos. 143 and 145

EXHIBIT: Scintilla Magneto Division and Zenith Carburetor Division of Bendix Aviation Corporation will exhibit jointly. Scintilla Magneto Division will exhibit magnetos and other ignition devices, as well as fuel injection equipment for Diesel engines.

Representatives: Scintilla representatives will be A. J. Poole, sales engineer; Carl Sorensen, sales engineer, and A. T. Bremser, fuel injection equipment engineer.

●

SCOVILLE MANUFACTURING COMPANY

Waterbury, Connecticut

Exhibiting in Maintenance Engineering Corporation section.

●

SCULLY STEEL PRODUCTS COMPANY

Chicago, Illinois

See exhibit United States Steel Corporation Subsidiaries.

●

SECURITY ENGINEERING COMPANY, INC.

Whittier, California

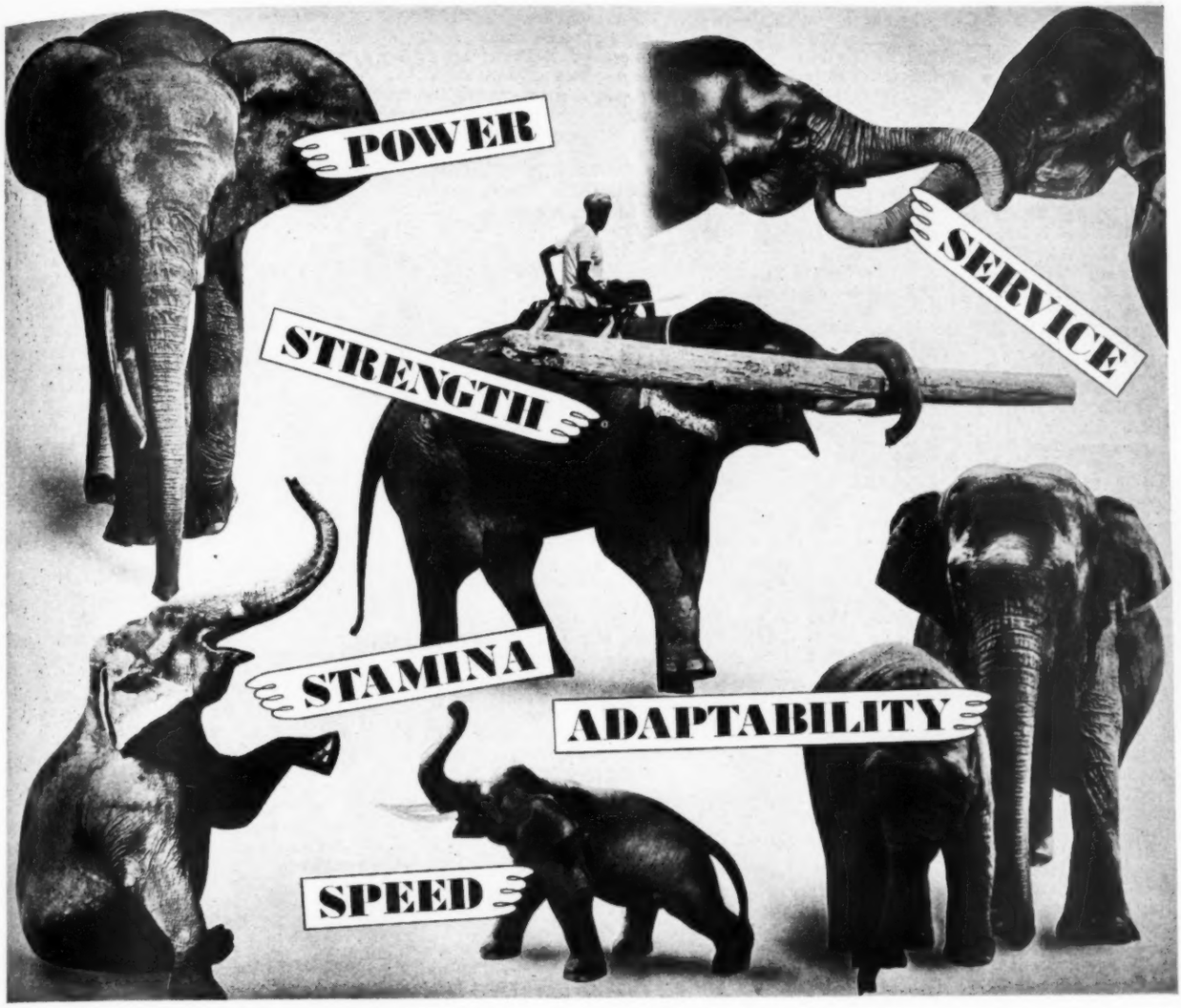
Booth No. 1213

EXHIBIT: Will feature the complete line of oil tools manufactured from "Securaloy," the drillable oil field metal, and will include several new tools recently introduced to the industry. Models of "Securaloy" products and accessories will be shown in full size, with sections cut away to illustrate their construction and operation. The entire line of "Securaloy" perforated screen pipe will also be on display, as will sections of the drillable pipe showing perforations made by both the gun and mechanical method.

A special feature of this year's exhibit will be the showing of the various manufacturers' canvas wrapped packers made of "Securaloy."

The Sievers reamer will be exhibited in the Wilson Supply Company booth.

Representatives: W. E. Sievers, vice-president; Al Forrow, sales manager of Cali-



They "have what it takes" to do your work

Americans have what it takes, and it *takes* plenty! Oil-field service, with its tremendous loads, strains and impacts, is the supreme test of bearing quality. When you realize that American Roller Bearings are in standard use by the *majority* of drilling-equipment manufacturers, and that *not one American* application has ever been abandoned, you see what we mean when we say that these heavy-duty bearings *dominate* in the oil industry.

If you *use* drilling equipment, specify American Heavy-Duty Roller Bearings. If you *make* drilling equipment, remember that your products will perform better with *Americans* in the heart of the assembly.

AMERICAN ROLLER BEARING COMPANY
PITTSBURGH, PA.
Pacific Coast Office:
321 W. Pico St., Los Angeles

AMERICAN HEAVY DUTY ROLLER BEARINGS

fornia; H. S. Sutton, Gulf Coast manager, Houston; and Pat Robinson, assistant Gulf Coast manager.

●

SECURITY RUBBER AND BELTING COMPANY
Buffalo, New York

Exhibiting in Mid-Continent Supply Company section.

●

SERVICE PATTERN AND MODEL WORKS
Houston, Texas

Booth No. 413

EXHIBIT: Will have a number of patterns on display that will easily be identified by the oil trade.

Representatives: H. C. Brinkman, Charles Buck, and T. W. Russell.

●

SERVICE RECORDER COMPANY
Cleveland, Ohio

Exhibiting in Transportation Equipment Company section.

●

SHAFER BEARING CORPORATION
Chicago, Illinois

Booths Nos. 1514 and 1516 (Annex)

EXHIBIT: Representative line of self-aligning roller bearings, pillow blocks, and other mounted units. One of the features of the exhibit will be a 7-in. electric-welded steel pillow block for use on heavy-duty drawworks. Another feature will be a bent shaft display consisting of a shaft having a 1½-degree bend mounted in two pillow blocks and revolving at slow speed. This illustrates the self-aligning action of the bearings and seals.

Representatives: R. B. Hoover, president; M. J. Tennes, Jr., vice-president; J. Dan Malone, sales manager; A. H. Williams, chief engineer, and E. H. Verrall, advertising manager. Texas and Oklahoma representatives of the company: George J. Fix, Sr., and George J. Fix, Jr., Dallas, Texas. Kansas and Nebraska representative: A. S. Kennedy, Kansas City, Missouri. Louisiana and Tennessee representative: J. H. Sprenger, Memphis, Tennessee. California representative: E. D. Maltby, Los Angeles, California.

●

SHAFFER TOOL WORKS
Brea, California

Booths Nos. 317, 319, and 321

EXHIBIT: Equipment on display will include Shaffer cellar control gates, Shaffer adjustable flow beans, Shaffer kelly cocks, Shaffer spool type landing head, and Shaffer rod spacer.

Representatives: W. D. Shaffer, Carl W. Vogt, Ben J. Ross, S. R. Setser, Charles E. Geddes, and John H. Moran.

●

SHELL PETROLEUM CORPORATION
Houston, Texas

Booths Nos. 1302 and 1401 (Annex)

●

THE SHERWIN-WILLIAMS COMPANY
Cleveland, Ohio

Booth No. 1331 (Annex)

EXHIBIT: Display will show a composite view of houses, tank cars, derricks, and other structures of the petroleum industry, in color and in relief against an ivory background with a blue panel top showing the owner of the booth as The Sherwin-Williams Company, and their product—Petroleum Finishes.

There will be panels showing Sherwin-Williams Kem Lustral Enamel. a synthetic type of enamel that can be brushed, sprayed, or dipped. Kem Lustral Enamel has outstanding weather-resistance, and can be used on both metal and wood surfaces, the makers state. It is made in all popular colors used by the petroleum industry.

Representatives: W. J. Montgomery, general manager of transportation and petroleum sales, Cleveland; Bryan Davis, Texas manager, transportation and petroleum sales, Dallas, Texas; J. R. Stevenson, petroleum sales representative, Dallas; E. L. Rumph, petroleum sales representative, Houston, Texas, and Joe Gebhardt, petroleum sales representative, Tulsa, Oklahoma.

●

SIVYER STEEL CASTING COMPANY
Milwaukee, Wisconsin

Exhibiting in M. N. Dannenbaum section.

●

SKF INDUSTRIES, INC.
Philadelphia, Pennsylvania

Booths Nos. 756 and 758

EXHIBIT: Display will consist of a complete line of SKF ball and roller bearings and transmission appliances.

Representatives: R. H. DeMott, F. E. Ericson, Robert C. Byler, A. H. Schmal, J. L. Brusca, W. F. Weidner, H. L. Gaddis, R. W. Carroll, H. A. Dixon, and A. Katzenberg.

●

SKINNER PURIFIERS, INC.
Detroit, Michigan

Booth No. 1333 (Annex)

EXHIBIT: A large stationary purifier for purifying drainages from Diesel engines, engine filters for continuous and positive control of lubricating oil in Diesel engines, a small stationary unit, and cutaway models of lubricating and fuel oil filters.

Representatives: Mr. Ravenna, Texas representative; Julian P. Van Vorst, subsidiary representative in Texas; Mr. Creel and T. Laney, representatives from Tulsa, Oklahoma; C. B. Skinner, of the C. B. Skinner Company, New Orleans, Louisiana, and Paul Williams, president and general manager.

●

A. O. SMITH CORPORATION
Milwaukee, Wisconsin

Booths Nos. 738 and 740

EXHIBIT: Various sizes of the company's high-yield casing will be displayed and in some suitable manner the company will demonstrate what it has to offer the oil industry in high-pressure vessels, large-diameter line pipe, and oil-well casing.

Representatives: C. C. Joys, Jr., vice-president in charge of sales; B. F. Bart, sales manager, Gulf Coast Division; A. E. Butts, district sales manager, Tulsa, Oklahoma; H. A. Bourne, Jr., district sales manager, Houston, Texas; Stanley Carpé, Houston office; R. Furrer, vice-president in charge of engineering; W. R. Kepler, chief engineer; T. M. Jasper, technical research consultant, and J. Dilot, advertising manager.

●

E. M. SMITH COMPANY
Los Angeles, California

Booth No. 1122

EXHIBIT: The complete line of Grizzly products for oil field service will be on display at the company's booth, including Grizzly full-moulded rotary brake blocks; Grizzly-Powerflex, Grizzly Red Line, and Grizzly Cub rotary hose; Grizzly Giant drill-pipe protectors; Grizzly tubing protectors; Grizzly unit pressure relief drill-pipe protectors; Grizzly "No-Wip" wire line saver, and the Grizzly wire line turn back.

Among the important features of interest to drilling crews will be the Grizzly Brake Block Band Exchange Plan, inaugurated by the company several years ago in order that operators may be assured of the correct lining for drawworks as specified by the manufacturer; and also to insure perfect factory installation of lining on bands when reline jobs are necessary. According to the manufacturer, this exchange plan provides the operator with new bands for all types of drawworks equipped with Grizzly full-moulded brake blocks precision fitted at the factory at no extra cost. Blocks and bands are drilled correctly to manufacturers' specifications. The plan saves time and labor and eliminates the many difficulties of field installation, such as incorrect sizes, improper fitting of lining to bands, out-of-round and worn bands, etc. Details of the plan will be described to those interested, and samples of the new relined bands will be on display.

Representatives: Walter Smith, vice-president; Paul Kelting, Houston district representative, and Ed Carter, Oklahoma City district representative.

●

GORDON SMITH AND COMPANY
Bowling Green, Kentucky

Exhibiting in Egner Brothers section.

●

HOWARD SMITH COMPANY
Houston, Texas

Booth No. 1107 (Annex)

EXHIBIT: Equipment to be shown includes the Stancliff wire-wrapped well screen and variable choke for oil wells.

Representatives: Percy F. Matlock, Eddie E. Davidson, C. W. Wood, Edward Burns, H. D. Wilson, and W. B. Robinson.

●

SMITH METER COMPANY
Los Angeles, California

Booth No. 1562 (Annex)

EXHIBIT: The following equipment will be shown: Smith oil and gasoline meters, Smith crude oil meters, Smith butane and propane meters, Smith high-pressure meters, Smith valves, Smith air-eliminating devices, and Smithway water pumps.

Representatives: Allan A. Floyd, president; C. E. Valentine, Jr., regional sales manager, Dallas, Texas; G. O. Tate, Tulsa district manager; R. N. Ward, Houston district manager; T. M. Penny, Denver district manager, and E. F. Eckel, chief sales engineer.

●

SMITHWELD COMPANY
Houston, Texas

Exhibiting with Big Three Welding Equipment Company.

●

SMITH WELDING EQUIPMENT CORPORATION
Minneapolis, Minnesota

Booths Nos. 1586 and 1588 (Annex)

EXHIBIT: Oxy-acetylene welding and cutting regulators, Lifetime welding and cutting torches, acetylene generators and a-c. electric welders, all of the manufacture of this company, will be displayed.

Representatives: C. E. Porter and J. R. Clark.

●

C. KENNETH SMULLEN
Fort Worth, Texas

Exhibiting in Pettibone Mulliken Corporation section.

●

THE SONNER BURNER COMPANY
Winfield, Kansas

Booths Nos. 1521 and 1523 (Annex)

EXHIBIT: Gas burners for domestic and oilfield use and non-freeze valves will be on display.

Representatives: P. J. Sonner, president; R. L. McCall, K. D. Goodwin, H. P. McCullough, S. A. Swoyer, and M. V. Stocking.

●

SOUTHERN ENGINE AND PUMP COMPANY
Houston, Texas

Booth No. 1046 (outside)

EXHIBIT: Equipment on display will include:

One 12-cylinder, 350-hp. Le Roi drilling engine equipped to operate on both natural gas and butane fuel. This engine likely will be operating on butane during the Show.

SEAMLESS
for SAFETY
For safety, for speed of drilling, for ease of running, Youngstown recommends seamless Oil Country Tubular Goods. Our new seamless mill is the most modern in the industry, with new automatic controls which assure uniform walls, even lengths and pipe of great strength. For safe, sure, dependable casing, tubing and drill pipe, specify Youngstown Seamless.
THE YOUNGSTOWN SHEET AND TUBE COMPANY
Manufacturers of Carbon and Alloy Steels
General Offices YOUNGSTOWN, OHIO
YOUNGSTOWN
Pipe and Tubular Products - Sheets - Plates - Conduit
Tin Plate - Bars - Rods - Wire - Nails - Unions - Tie
Plates and Spikes
Youngstown's pipe is distributed by:
The Continental Supply Co., - - - Dallas, Texas
Continental Emsco Co., Inc.,
30 Rockefeller Plaza, New York City
Republic Supply Co. of California,
Los Angeles, California
2-11B
TRADE MARK
AD C24 S
AD C24 S
AD
AD

One 6-cylinder, 175-hp. drilling engine equipped with combination natural gas-gasoline equipment.

Four various sizes of special Le Roi pumping engines having complete equipment for combination natural gas-gasoline carburetion.

One 5-kw. Le Roi special electric light plant for general oil-field service.

One 2-kw. electric light plant with combination gas-gasoline carburetion.

One Pomona geared head pump drive operated by Le Roi gas engine.

In addition there will be two portable drilling rigs on the grounds equipped with large Le Roi drilling engines, together with several pumping units of various manufactures utilizing the Le Roi pumping engines.

In fact, the new H. L. Turney air-operated gear-drive drawworks will be equipped with a Le Roi 250-hp. drilling engine operating on natural gas, shown in operation on the grounds. This is one of the latest developments in drawworks units.

Representatives: For Southern Engine and Pump Company: D. N. Wommack, W. G. Price, H. H. McGilvray, Richard Kropp, Linn K. Park, and Walter A. Price. For Le Roi Company: W. R. Karll, sales manager; L. G. Valdes, Tulsa, Oklahoma, and P. W. Eells, chief engineer.

●

SPANG CHALFANT, INC.
Pittsburgh, Pennsylvania

Booths Nos. 144, 146, 245, and 247

EXHIBIT: Spang "C.W." pipe, "Standard" seamless shrink thread drill pipe and "Standard" seamless extreme line casing will be shown.

Representatives: H. G. Texter, L. L. Brundred, R. M. Burk, A. S. Weaver, C. C. Brush, and D. C. Neely.

●

SPEEDER MACHINERY CORPORATION
Cedar Rapids, Iowa

Booth No. 1041-A (outside)

EXHIBIT: An "LS-40" ⅜-yard convertible shovel driven by a 42-hp. engine and equipped with "Caterpillar" crawlers. This machine is especially adaptable for slush pit or pipe loading work and is used by pipe line contractors. The machine weighs 19,600 lb. as a shovel and has road speed to 3.1 miles per hour.

Representatives: Harry H. Miller, Dallas, Texas; T. M. Deal, president of the company, and B. O. Eighmy, sales manager.

●

SPERRY-SUN WELL SURVEYING COMPANY
Houston, Texas

Booths Nos. 544 and 546

EXHIBIT: The following equipment will be shown:

Syfo Clinograph. A new type of "Go-Devil" protective casing will be shown, which has been successfully used in "Go-Deviling" Syfo to a depth of 12,500 ft., obtaining the record of inclination in an extremely short space of time.

H-K Magnetic Inside Single Shot. This instrument has protective casings of 1 1/16-in., 1¾-in., and 2-in. diameter, and, therefore, can be lowered inside the drill pipe and extended below the bit when making readings for direction and inclination when using a removable core barrel. This has the advantage that when obtaining a record of inclination and direction it is not necessary to make a round trip with the drill pipe, the makers state. The instrument can be used also for making inclinometer readings only inside the drill pipe, disregarding the compass readings.

This instrument can also be used in an open hole in which case it is desirable to use a protective casing of 3½-in. O.D., which is available for this instrument.

H-K Inclinometer. This instrument gives accurate inclinometer readings to 1/10th of a degree or better, it is stated. The instrument is self-checking, as it will not make a satisfactory record unless at rest at the depth at which the record is being sought. The instrument can be "Go-Deviled," thereby obtaining inclination records in a short space of time.

Polar Core Orientation. Improvements in the method of Polar Core Orientation as well as samples of cores will be shown.

Magnetic method of orientation of drilling tools. An entirely new and accurate method of orienting drilling tools will be demonstrated. It consists of checking the orientation of the tool by means of two small magnets inserted in a sub or drill collar in the same plane as the drilling tool, and by lowering a single-shot instrument to a point where the compass of the instrument is opposite the magnets in the sub, thereby obtaining record of the direction at which the tool or whipstock is set in the hole.

Representatives: G. L. Kothny, vice-president; R. L. Marston, regional manager; R. S. Hyer, and J. P. Klep.

●

STANDARD BATTERY MANUFACTURING COMPANY
Fort Worth, Texas

Exhibiting in Mid-Continent Supply Company section.

●

STANDARD BRASS AND MANUFACTURING COMPANY
Port Arthur, Texas

Booths Nos. 634 and 636

EXHIBIT: Exhibit will be in conjunction with Chase Brass & Copper Company.

Representatives: Henry LeBlanc. George Boane, C. T. Bell, J. Wickstrom, and N. W. Mitchell.

●

THE L. S. STARRETT COMPANY
Athol, Massachussets

Booth No. 516

EXHIBIT: A representative display of precision tools, dial indicators, hack saws, and steel tapes.

Representative: W. J. Clark.

●

STEEL AND TUBES, INC.
Cleveland, Ohio

Booths Nos. 125, 127, 129, 131, 133, 135, 137, and 139 (with Republic Steel Corporation)

EXHIBIT: Along with the various samples of different classes of tubing manufactured will also display a small hydraulic crushing press on which small sections of Electrunite boiler tubing will be smashed out of shape to show the ductility and strength of the material. Part of the background for the exhibit will be a large illuminated and animated replica of the company's trade mark.

Representative: E. B. Kelly.

●

STEWART AND STEVENSON COMPANY
Houston, Texas

Booth No. 1068 (outside)

●

ST. LOUIS CORDAGE MILLS
St. Louis, Missouri

Booth No. 200

EXHIBIT: Products on display will be as follows:

Amco "All-Weather" manila rope, the fibres of which are treated against deterioration caused by dry rot, etc.

American Superior Best manila rope, Trojan manila spinning lines, American Best manila catlines, American Superior manila derrick lines.

The company's new Super-Wear drilling cable made of 12 lessoms and asserted by the makers to represent a marked improvement and a new construction in the manufacture of manila drilling cable will also be shown. The additional three lessoms impart to the cable an increased abrasive resistance the manufacturers state.

Some of the oil-field cordage will be displayed on a turntable with spot lights playing on it.

There will be literature and various complimentary samples.

Representatives: Harold V. Pate, and R. S. Norris, southwestern sales manager, Galveston, Texas; A. J. Ressel, Galveston, and E. E. Fries, assistant sales manager.

●

R. B. STRICKLAND AND COMPANY
Waco, Texas

Exhibiting in Witte Engine Works section.

●

STRONG, CARLYLE AND HAMMOND COMPANY
Cleveland, Ohio

Exhibiting in W. H. Curtin and Company section.

●

SULLIVAN MACHINERY COMPANY
Michigan City, Indiana

Booth No. 1023-A (outside)

EXHIBIT: A complete working model of a Sullivan Pumphead, including derrick hanging equipment, pumphead, volume tanks, heater, and compressor will be shown.

A Sullivan No. 41 core drill on a Marmon Herrington truck.

Field views and detail views will be used to show the applications of the company's No. 36 lightweight motorized shot-hole drill, the No. 37 structure testing drill, and the No. 51 portable deep structure testing and shallow production drill.

There will be a display in miniature of the new String-A-Lite vapor-proof derrick lighting sets.

The Sullivan Alleviator will be displayed in picture style. This Alleviator is a pneumatic cushion to attach to standard beam pumping units between the beam and the polished rod.

Representatives: J. W. Haddock, vice-president; H. T. Walsh, vice-president; J. A. Noyes, manager oil field sales; J. B. Martin, manager core drill division; P. D. Cornelius, oil field sales department; C. L. Van Da Griff, salesman; J. E. M. Schultz, salesman; Walter A. Krevis, salesman; G. E. Smedberg, Dallas sales; H. C. Johansen, core drill engineer; H. H. Vanderzee, core drill designer, and W. H. Wineman, pumphead engineer.

●

C. J. TAGLIABUE MANUFACTURING COMPANY
Brooklyn, New York

Booths Nos. 358, 360, 459, and 461 (with W. H. Curtin and Company)

EXHIBIT: A new Superspeed Celectray recording pyrometer designed to expose heretofore uncharted, but vital, temperature changes will be operated to show how six different accurate temperature records can be made in a period of 30 seconds.

Another new Celectray pyrometer, Model No. V, of the indicating type, will be shown for the first time. This instrument employs the Celectray principle.

Three new pyrometer developments will be featured: the Celectray indicating potentiometer controller (self-balancing type), the Celectray multiple point indicating potentiometer, and the Celectray multiple point indicating controller. The latter can be supplied equipped with three to six points, each having the same sensitivity as the Celectray single point instruments.

A new line of pressure-spring recorders and recorder-controllers for temperature, pressure, and flow, having 9-, 10-, and 12-

in. charts, will be introduced.

The new float type throttling level controller, a complete line of oil testing instruments, the Tag magnetic clutch flow instruments, Tag industrial thermometers, Tag etched stem laboratory thermometers, and Tag hydrometers also will be displayed.

Representatives: E. D. Wacker, general sales manager; R. M. Wilhelm, division sales manager; A. G. Koenig, district manager, and L. Van Blerkom, division sales manager.

●

TAYLOR FORGE AND PIPE WORKS
Chicago, Illinois

Booth No. 753

EXHIBIT: Taylor Forge seamless forged-steel welding fittings and forged-steel flanges.

Representative: Paul R. Bush.

●

TAYLOR INSTRUMENT COMPANIES
Rochester, New York

Booth No. 449

EXHIBIT: Indicating, recording, and control instruments for temperature, pressure, and flow, as utilized in the oil industry, will be on exhibition. The new Taylor Fulscope recording controller will be the feature of the display. Also shown will be indicating and recording pressure gauges for mud pump service. Self-Acting regulators for crude oil treatments, Gold-Shield Etched Stem thermometers for laboratory use, Permax hydrometers, and Binoc industrial thermometers.

Representatives: A. J. Fleig, of the Rochester office, will be in charge of the Taylor exhibit, assisted by E. H. Triphaus, L. G. Marsh, D. J. Condit, and H. A. Brown of the Taylor Instrument Companies' Tulsa office. Also in attendance will be R. E. O'Neil of the Industrial Scientific Supply Company, Houston, Texas.

●

TECHNICAL OIL TOOL CORPORATION, INC.
Los Angeles, California

Booth No. 228

EXHIBIT: Will have on display the Totco Recorder for controlled vertical drilling, including demonstrational equipment pertaining to methods of vertical drilling control, as well as interesting information pertaining to the construction and maintenance of precision instruments.

Representatives: J. B. Wood, president; E. G. McConnell, manager of Mid-Continent operations, and James V. Robinson, manager of field operations.

●

TEMPLETON, KENLY AND COMPANY
Chicago, Illinois

Booth No. 312

EXHIBIT: The new No. 310A emergency jack will be displayed. This jack, in addition to maintaining the features of the No. 310, lifts 37 percent easier, has a 1-in. greater lift, has a greater base area, eliminates stooping as the base locking hook can now be foot operated, has a more convenient carrying handle and longer and wider rack bar toe lift, a greater overload capacity, and greater strength built into every detail, according to the manufacturers.

A new No. 440 Simplex heavy-duty worm-gear rod-line jack also will be shown. The new No. 440 has a fully enclosed geared mechanism and a speed crank for rod line slack take-up. Belt stretchers can be supplied with the No. 440 as well as with the No. 434 rod line jack, which has a capacity of three tons.

Simplex adjustable boiler supports for quickly and easily setting up oil-field boilers without timbering and shimming will also be exhibited for the first time.

A No. 85A 5-ton single-acting automatic raising and lowering jack, which contains many important improvements over its predecessor, the No. 85, will also be on display.

Other jacks on exhibition are cable reel jacks, light- and heavy-duty riggers' jacks, journal jacks, ball bearing screw jacks, and the unusual Util-A-Tool, which pushes, pulls, spreads, clamps, lifts, and pulls open and closed faced wheels.

Representatives: Charles Neher, Dallas, Texas, will be in charge of the exhibit, assisted by J. B. Templeton, vice-president of the company.

●

TENNESSEE COAL, IRON AND RAILROAD COMPANY
Birmingham, Alabama

Exhibiting in United States Steel Corporation Subsidiaries section.

●

THE TEXAS COMPANY
Houston, Texas

Booths Nos. 712-B and 714

EXHIBIT: Will feature the company's automotive products.

●

TEXAS ELECTRIC STEEL CASTING COMPANY
Houston, Texas

Booths Nos. 432, 434, 436, 1129, and 1131

EXHIBIT: In Booth No. 1131 sample steel castings will be displayed. This booth will be in charge of F. M. Wittlinger and C. K. Tharp.

Booths 432, 434, and 436 will be service booths. Will have in these booths telephones and the Postal Telegraph Company will have a teletype machine from which messages can be sent direct from the auditorium. There will also be six to ten young ladies to deliver messages and run errands throughout the grounds. This booth will be in charge of C. W. Shartle.

●

TEXAS FOUNDRIES, INC.
Lufkin, Texas

Booth No. 1325 (Annex)

EXHIBIT: Malleable castings used in the manufacture of oil field equipment will be displayed.

Representatives: Col. C. C. Chambers, general manager; R. S. Bradshaw, Jr.; Herman H. Brien, sales manager, and Martin E. Gorman, sales department.

●

TEXAS IRON WORKS
Houston, Texas

Booths Nos. 244, 246, 248, 345, 347, and 349

EXHIBIT: Equipment to be exhibited includes T-I-W bits, T-I-W packers and setting tools, T-I-W heaving shale drilling assemblies, T-I-W safety joints, T-I-W slips, T-I-W tubing slips and spiders, T-I-W compounding valves, T-I-W back-pressure valves, T-I-W kelly joint safety valves, T-I-W lubricated grief stem safety valves, T-I-W casingheads and tubingheads, and a general line of oil industry products.

Representatives: L. M. Pearce, vice-president and general manager; Walter Church, chief engineer; S. P. Vinnage, salesman, and Edwin Goodwin, sales manager.

●

TEXAS PIPE BENDING COMPANY
Houston, Texas

Booth No. 148

EXHIBIT: Display will include a representative model of pipe bends on short radii, and samples of other bends, coils, and welded assemblies.

Representatives: A. S. Beeley, owner; G. E. Duckworth, sales engineer; James A. Beeley, sales engineer, and Raymond Beeley, plant superintendent.

TEXAS RUBBER AND SPECIALTY CORPORATION
Houston, Texas

Booths Nos. 300 and 301

EXHIBIT: The display will include Okeh pump replacement parts, including Okeh pistons, Okeh liners, Okeh rods, and packings, as well as Okeh valves. Various constructions of these products will be shown, together with other mechanical rubber specialties of the company's manufacture.

Representatives: H. W. Millmine, president and general manager; T. P. Burns, Jr., vice-president; V. B. Root, secretary-treasurer; A. J. Martin, sales representative; J. H. Bannister, sales representative; H. K. Warren, sales representative; W. H. Nall, sales representative; T. E. Hamiter, sales representative, and A. S. Herron, sales representative.

●

TEXASTEEL MANUFACTURING COMPANY
Fort Worth, Texas

Booths Nos. 412 and 414

EXHIBIT: Display will consist of sucker rods, pull rods, and steel castings.

Representatives: A. J. Armstrong, R. C. Armstrong, T. Killman, and Worth Daniels.

●

TEXSTEAM CORPORATION
Houston, Texas

Exhibiting with Bettis Sales Company.

●

THOMPSON PUMP COMPANY
Okmulgee, Oklahoma

Exhibiting in Manning Oil Specialties section.

●

THOMPSON TOOL COMPANY, INC.
Iowa Park, Texas

Booth No. 1016-C (outside)

EXHIBIT: Shale separator and sample machine operated by the flow of mud will be in operation. Both are rotary screen drum type, separating shale from mud and producing an accurate sample of both for geological purposes.

Representatives: L. L. Thompson and W. H. Clark.

●

THORNHILL-CRAVER COMPANY, INC.
Houston, Texas

Booths Nos. 445 and 447

EXHIBIT: In addition to the full line of Unibolt Couplings, several new and improved products will be shown, including high-pressure steel Christmas tree fittings, adjustable and positive type chokes, and flexible ball joints. Each of these new products features the use of the Unibolt Coupling principle.

Representatives: R. S. Warren, T. W. Walker, Jack Howe, Homer Thornhill, Kenneth Craver, and Forrest Ludlow.

●

THE TIMKEN ROLLER BEARING COMPANY
Canton, Ohio

Booths Nos. 464 and 466 (Annex)

EXHIBIT: Special display showing bearings that are used in gas and oil pumping engines, steam drilling engines, geared rotaries, swivels, slush pumps, geared pumps, crown blocks, pumping units, double reduction pumping units, and pumping powers.

Representatives: W. B. Moore, general manager industrial division; S. M. Weckstein, chief engineer industrial division; Fred Reiser, Pittsburgh, Pennsylvania, sales engineer; H. W. Trump, Dallas, Texas, district manager; S. T. Salvage, Houston, Texas; W. F. Anderson, St. Louis, Missouri, district manager, and John Borland, assistant chief engineer industrial division.

EDGAR TOBIN AERIAL SURVEYS
San Antonio, Texas

Booths Nos. 157, 159, and 161

EXHIBIT: A representative display of controlled aerial photographic mapping, ownership and regional control mapping developed from the aerial photographic base, also arranged and presented to demonstrate the application of the company's map system in the oil business.

Representatives: Edgar Tobin, James Atkinson, George Rice, and others.

●

THE TOLEDO PIPE THREADING MACHINE COMPANY
Toledo, Ohio

Booths Nos. 365 and 367

EXHIBIT: Will display the company's complete line of "Toledo" pipe machines.

Representatives: The exhibit will be in charge of C. A. Wagner, Texas representative, assisted by E. H. Recker, Hugh Tiernan, and W. R. Vosper.

●

TOWMOTOR COMPANY
Cleveland, Ohio

Booth No. 1581

EXHIBIT: Towmotor straight gasoline-powered tiering truck, fork type.

Representative: C. G. Forshey.

●

TRANSPORTATION EQUIPMENT COMPANY, INC.
Houston, Texas

Booths Nos. 1023-B and 1028-A (outside)

EXHIBIT: Equipment on display will include:

Marmon-Herrington All-Wheel-Drive trucks.

Timken trailer axles and 6-wheel conversion units.

Torrance steam cleaning machines.

Bendix B-K power brakes.

Deluxe oil filters.

Representatives: For Marmon-Herrington Company: A. W. Herrington, president; Bert Dingley, vice-president; C. Alfred Campbell, general sales director; Harold L. Fisher, sales and service engineer; Charles Ambrose, sales and service engineer; Ray Schmeltz, sales and service engineer, and R. L. Skidmore, sales and service engineer. For Transportation Equipment Company: J. L. Parker, vice-president; T. E. Ferris, office manager; W. J. Voisen, representative; D. L. Vorderman, representative; W. R. Hodge, representative; J. H. Anderson, representative, and Carl Sheehan, representative.

●

TRETOLITE COMPANY
Webster Groves, Missouri

Booths Nos. 638 and 640

EXHIBIT: An electrical display of the Tretolite method of conditioning crude oil to pipe line requirements.

Representatives: K. R. Farr, vice-president; Gordon S. Nees, M. J. Mullally, and E. H. Dayvault.

●

TRINITY PORTLAND CEMENT COMPANY
Dallas, Texas

Booths Nos. 1207 and 1209 (Annex)

EXHIBIT: Photographs of unusual and outstanding oil-well cementing jobs and charts showing the performance of each type of the company's oil-well cements.

Representatives: Cedric Willson, research engineer; Jack Barnes, petroleum engineer; L. L. Cummings, petroleum engineer; Sven Rordam, director of research, Central Research Laboratories, and H. B. Gillette, district sales manager, Houston, Texas.

●

TRUSCON STEEL COMPANY
Youngstown, Ohio

Exhibiting in Republic Steel Corporation section.

TUBE-TURNS, INC.
Louisville, Kentucky

Booth No. 620

EXHIBIT: Will display the complete Tube-Turn line of fittings for pipe welding and forged-steel flanges.

Representatives: J. G. Seiler, sales manager; R. E. Fritsch, vice-president; W. B. Whenthoff, manager Mid-Continent district, and F. S. Schwinn, manager Southwest district.

●

TUBOSCOPE OF TEXAS
Houston, Texas

Exhibiting in Oil Field Machine and Supply Company section.

●

TULSA OIL THIEF COMPANY
Tulsa, Oklahoma

Exhibiting in W. L. Walker Company section.

●

TURCO PRODUCTS, INC.
Los Angeles, California

Booth No. 617

EXHIBIT: Display and demonstrations of a variety of exclusive cleaning compounds to facilitate the many cleaning operations encountered throughout the oil industry. These Turco products are for cleaning the heavy equipment found in oil fields, salvage departments, refineries, service stations, and wherever the oil man has a cleaning task to perform.

Representatives: Vachel O. Poole, Texas district manager, Houston, Texas, and Andy Ospring, salesman.

●

TWIN DISC CLUTCH COMPANY
Racine, Wisconsin

Booths Nos. 1320 and 1322 (Annex)

EXHIBIT: Model E, two-plate, 18-in. clutch, cutaway model to show its construction. This model clutch is especially designed for heavy-duty services, including shock loads. The same model clutch also will be exhibited having a stub shaft provided with a flange for bolting onto the crankshaft or flywheel of an engine in instances where an extra rigid mounting is desirable.

Another product that will be exhibited in cutaway form to show its construction will be a Twin Disc Power Take-Off unit for use with internal combustion engines. Twin Disc Power Take-Offs are used as a link between the engine and the pump. Extra-large diameter shafts and the use of oversize anti-friction bearings permit overhanging pulleys slightly exceeding the width of the shaft extension to be used on these power take-offs without the necessity of an outboard bearing.

A new Twin Disc product that will be exhibited is its Model MT Multiple Disc Clutch. The "in-oil" type of clutch will be exhibited in single construction, the dry type in duplex construction. The duplex type may be used as a two-speed drive or one of its clutches may be used as a brake or a power reverse drive. The outstanding features of the new Model MT clutches are their compactness, high torque capacity for their size, and the comparatively low-operating pressure required, the manufacturers state.

Also will exhibit a Marine reverse and reduction gear unit.

Representatives: G. M. Guilbert, vice-president; J. B. Jenkins, Mid-Continent manager; G. Gibson, Dallas, Texas, office; C. Cushman, Dallas office; J. Crater, Tulsa, Oklahoma, office, and E. J. Christopher, Tulsa office.

TWIN SEAT VALVE COMPANY
Beaumont, Texas

Exhibiting in W-K-M Company section.

●

UNA WELDING, INC.
Cleveland, Ohio

Booth No. 1504 (Annex)

EXHIBIT: Will have in operation an automatic welding head and will display a complete line of welding electrodes. The automatic head will be the big feature. It is used to weld automatically oil-field equipment of all types.

Representatives: W. B. Baker, vice-president and general manager, Cleveland, Ohio; Gil V. Dye, manager Unaweld Manufacturing Company of Texas; an engineer from the factory at Cleveland to operate the automatic head, and the sales force of the Texas organization.

●

UNAWELD MANUFACTURING COMPANY OF TEXAS
Houston, Texas

Exhibiting in Gil V. Dye Company section.

●

UNION CARBIDE AND CARBON CORPORATION
New York, New York

Booths Nos. 109, 111, 113, and 115

EXHIBIT: Haynes Stellite Company, The Linde Air Products Company, and the National Carbon Company, Inc., all units of Union Carbide and Carbon Corporation, will exhibit jointly.

Many applications of Haystellite cast tungsten carbide and Haynes Stellite wear-resistant hard-facing rods will be prominently shown in the Haynes Stellite Company exhibit. Featured will be the use of Haystellite products for hard-setting and hard-facing oil-well bits. How to obtain the longest possible life from rotary bits will be emphasized in this part of the exhibit. In another display, the use of Hastelloy alloys for minimizing corrosion losses in refinery equipment handling sulphuric and hydrochloric acids will be demonstrated.

The National Carbon Company exhibit will consist of carbon tower sections, carbon Raschig rings for tower packing, carbon brick and tile. Application of these materials to various forms of construction will be demonstrated. Many of these applications are new and offer the industry a material of construction of considerable economic advantage. The exhibit will also include a display of carbon ground rods available in 2-, 4-, and 6-in. diameters by 80 in. long designed for the cathodic protection of pipe lines.

The Linde Air Products Company will feature uses of the oxy-acetylene process in oil field operations. The display will show, by actual demonstration, shape-cutting with oxy-acetylene cutting machines, and the welding of oil-well casing. On display will be a pipe-cutting machine and other oxy-acetylene welding and cutting equipment and flame-hardening apparatus.

Representatives: Those in attendance at the Haynes Stellite Company exhibit will include E. E. LeVan, vice-president and general sales manager, Kokomo, Indiana; C. W. Metzger, district sales manager, Houston, Texas; W. S. Tromley, district sales manager, Tulsa, Oklahoma; F. S. Badger, research metallurgist, Kokomo; R. L. Lerch, advertising manager, Kokomo, and W. A. Wissler, assistant manager of Union Carbide and Carbon Research Laboratories, Inc., Niagara Falls, New York. Representatives of National Carbon Company will be H. H. Frasch, S. A. Mattison, M. J. Dorcas, and G. H. Mayer, Jr.

REDA...WILL DISPLAY THE MOST MODERN METHOD OF REDUCING PUMPING COSTS

The Reda Submergible Electrical Centrifugal Oil Well Pump will be displayed in Space 1528-30 Oil-World Exposition.

Houston — April 24-29

REDA PUMP CO.

BARTLESVILLE, OKLA.

THE ONLY SUBMERGIBLE ELECTRICAL CENTRIFUGAL OIL WELL PUMP

UNION DRAWN STEEL DIVISION
REPUBLIC STEEL CORPORATION
Massillon, Ohio

Exhibiting in Republic Steel Corporation section.

●

UNITED STATES RUBBER COMPANY
New York, New York

Booths Nos. 750 and 752

Exhibiting in Petroleum Tire and Supply Company section.

●

UNITED STATES STEEL CORPORATION SUBSIDIARIES
Pittsburgh, Pennsylvania

Booths Nos. 458, 460, 559, and 561

EXHIBIT: The United States Steel Corporation subsidiaries will have an unusually complete and interesting display of products used in the petroleum industry. Products of the American Steel and Wire Company, Carnegie-Illinois Steel Corporation, Cyclone Fence Company, Tennessee Coal, Iron and Railroad Company, Universal Atlas Cement Company, and Scully Steel Products Company will be shown.

Featured in this exhibit will be Unaflo and Lunnite, as well as other cements, Tiger Brand wire rope and American electrical wires and cables, Cyclone property protection fence and gates, roofing and siding sheets, high tensile and alloy steels, and special examples of the increasing use of stainless steel for high strength and corrosion resistance.

Every effort has been made to make this display outstanding and the central panel around which the booth has been designed is unique.

Representatives: For American Steel and Wire Company: C. F. Wiley, H. R. Klein, T. A. Goggins, E. T. Eggers, H. L. Richardson, Sears Doan, and Otto Kroeger. For Cyclone Fence Company: A. M. Eaton, W. B. Moore, Joe Denton, J. D. Hill, and L. E. King. For Carnegie-Illinois Steel Corporation: E. C. Noble, Jr., J. J. Newport, K. E. Luger, F. L. Gibbons, H. S. Schroeder, and A. L. Kay. For Tennessee Coal, Iron and Railroad Company: E. E. Aldous, G. J. Stewart, F. C. Buck, W. H. Andrews, E. G. Laws, J. F. Tompkins, and R. J. Stakelum. For Universal Atlas Cement Company: C. H. Boice, I. F. Bingham, R. L. Chance, N. C. Hoyt, and G. G. Smith.

●

UNITED SUPPLY AND MANUFACTURING COMPANY
Tulsa, Oklahoma

Booths Nos. 1203 and 1205

EXHIBIT: Will display A. Leschen and Sons wire rope, and a general line of oilfield equipment and specialties.

Representatives: H. B. Gutelius, F. P. Thieman, Chas. J. Halloran, C. M. Holland, W. T. Davis, and C. S. Herndon.

●

UNIVERSAL ATLAS CEMENT COMPANY
New York, New York

Exhibiting in United States Steel Corporation Subsidiaries section.

●

UNIVERSAL CORE BARREL COMPANY
Houston, Texas

Booths Nos. 210 and 212

●

UNIVERSAL ENGINEERING COMPANY, LTD.
Los Angeles, California

Booths Nos. 305 and 307

EXHIBIT: Zublin Simplex and Differential bits will be displayed.

●

UTILITY ELECTRIC STEEL FOUNDRY
Los Angeles, California

Booth No. 1400 (Annex)

EXHIBIT: Equipment displayed will be:

Hot-oil pump stainless steel parts and chrome molybdenum vanadium stainless plungers.

Bubble caps, vapor pipes, and return bend plugs.

Carburizing and cyanide pots and boxes.

18-8 stainless steel interior parts for pumps, gas regulators, and orifice fittings.

18-8 stainless parts for salt and mine water service.

Heat-resisting miscellaneous parts.

Representatives: J. T. Kidd, sales engineer; Ralph Fannin, district representative, and Frank K. Bennett, sales representative.

●

THE VAPOR RECOVERY SYSTEMS COMPANY
Compton, California

Booths Nos. 147 and 149

EXHIBIT: Will display tank vents, flame arresters, complete swing line equipment featuring a double swing line assembly, gas-tight automatic tank gauges, marine vent valves for tank ships, and vapor-recovery super-sensitive regulators.

Representatives: Frank V. Long, Frank M. Holloway, T. E. Ward, and H. O. Johanson.

●

VERNON TOOL COMPANY, LTD.
Los Angeles, California

Booths Nos. 1242 and 1244 (Annex)

EXHIBIT: Exhibit will be in conjunction with McNeely Materials Company, Houston, Texas, Mid-Continent and Gulf Coast distributors for the Vernon Tool Company. The McNeely vibrating mud screen and auxiliary driving equipment, such as electric motors, steam turbines, and gasoline engines will be shown.

Representative: J. W. McNeely.

●

VICTAULIC COMPANY OF AMERICA
New York, New York

Exhibiting with Hanlon-Waters, Inc., and Norvell-Wilder Supply Company.

EXHIBIT: Will display line of malleable-iron and forged-steel Victaulic pipe couplings, including working and pressure models.

●

VICTOR EQUIPMENT COMPANY
Cleveland, Ohio

Exhibiting in Big Three Welding Equipment Company section.

●

VICTOR MANUFACTURING AND GASKET COMPANY
Chicago, Illinois

Booth No. 1573 (Annex)

EXHIBIT: Equipment on display will include:

(a) Replacement gaskets for operating equipment such as engines, transmissions, speed reducers and all related drive mechanisms, as well as pumps. The gaskets will be of metal-asbestos composition (cylinder head, manifold, and washer flange gaskets such as used in original equipment by the manufacturers), and various treated paper, fibre, and compressed asbestos sheet packings. Also, all types of gaskets and packings used in pipe lines and the equipment needed for regular replacement in the oil industry.

(b) A complete display of Victoprene oil seals, cups, and packings made of a synthetic rubber compound.

Representatives: E. T. Freeman, sales representative, and A. J. Aukers, engineer.

●

VIKING PUMP COMPANY
Cedar Falls, Iowa

Exhibiting in Southern Engine and Pump Company section.

●

VISCO PRODUCTS COMPANY
Houston, Texas

Booth No. 202

EXHIBIT: Visco oil treating chemicals will be displayed.

Representatives: L. V. Musgrove, D. M. Jacks, F. L. Stone, F. A. Kroll, F. H. Thorne, and C. F. Spangler.

●

HENRY VOGT MACHINE COMPANY
Louisville, Kentucky

Booths Nos. 715 and 717

EXHIBIT: A general line of drop-forged steel and stainless steel valves and fittings. Will also show for the first time a new line of 150-lb. American standard flanged gate valves, as well as a new line of gate meter valves having union bonnet, ground joint, removable seats, and slotted gates in sizes ¼ in., ⅜ in., ½ in., ¾ in., and 1 in.

Representatives: W. S. Cannon, Jr., G. A. Daeuble, Jr., H. V. Heuser, and J. L. Massie, manager of Dallas office.

●

VOLCANO BURNER COMPANY
Houston, Texas

Booth No. 1544 (Annex)

EXHIBIT: The display will show two models of all-steel low-pressure gas burners manufactured by the company—the Gulf State and the Volcano Superior. The Volcano Superior will be featured in a new type installation and the new design of burner head never before shown.

Representatives: Roy S. Dodd and J. H. Mitchell.

●

VOLZ ENGINEERING AND EQUIPMENT COMPANY
Long Beach, California

Exhibiting in Gulf Engineers, Inc., section.

●

W. L. WALKER COMPANY
Tulsa, Oklahoma

Booth No. 1574 (Annex)

EXHIBIT: The following improved and new equipment will be displayed:

The Tulsa Oil Thief.
Tulsa Safety Gauging Reel.
Tulsa Car Water Heater.
Tulsa Electric Centrifuge.
Tulsa Hydrometer Case.
Tulsa Thermometer Case.
Tulsa Gaugers Equipment Case.

Walter Kidde and Company's Lux Carbon Dioxide fire extinguishers.

Representatives: W. L. Walker, Clifford Strain, and H. E. Bowman.

●

J. D. WALLACE AND COMPANY
Chicago, Illinois

Exhibiting in Egner Brothers section.

●

WALL ROPE WORKS, INC.
New York, New York

Booth No. 648

EXHIBIT: Will display all types and sizes of Wall manila oil-field cordage on a revolving cylinder placed in the center of the specially constructed exhibit booth.

Representatives: J. L. Dittman, district manager, and Jim England, Gulf Coast salesman.

●

WALWORTH COMPANY, INC.
South Boston, Massachusetts

Booths Nos. 656, 658, 660, 757, 759, and 761

EXHIBIT: Representative items from the company's complete line of valves, fittings, pipe, and tools will be displayed upon a specially constructed background.

Mud-line valves, Walworth Figure 85 flow-line drilling gate valves, and the Walworth line of lubricated plug valves will occupy a prominent part of the display. One of the features of the exhibit will be a 10-in. motor-operated carbon molybdenum steel gate valve designed for service at 1500 lb. working steam pressure at 950°F. This valve, which weighs more than 3000 lb., will be electrically equipped in order to demonstrate the operation of the valve.

Another valve that will be featured at the Walworth exhibit will be a 14-in. cast-steel valve for 3000-lb. working steam pres-

sure at 950°F., equipped for high-speed motor operation.

Walworth C.N.I. flanged pipe, Walco pipe wrenches, and Walworth genuine stillson wrenches will also be exhibited.

Representatives: Howard Coonley, chairman; W. B. Holton, president; J. M. Olmsted, vice-president of sales; F. W. Duemler, vice-president of sales; F. H. Morehead, vice-president of engineering; C. L. Bradbury, manager, Dallas, Texas, office; W. M. Combs, manager, Tulsa, Oklahoma, office; C. G. Finkle, manager, Houston, Texas, office; E. L. Clark, in charge of oil field sales; H. C. Nannen, in charge of refinery sales; H. G. Lambert, assistant manager, tool division; F. S. Markle, sales engineer; J. G. Younggren, salesman; R. J. Glascock, salesman; J. D. McManus, assistant chief engineer; P. B. Miller, tool sales; A. J. Pokorny, field sales; J. L. Rice, field sales; D. L. Rumsey, field sales, and L. F. Lamberty, field sales.

●

WAUKESHA MOTOR COMPANY
Waukesha, Wisconsin

Exhibiting with Portable Rig Company.

Representatives: J. G. Swain, sales manager, and Arch Campbell, manager oil-field sales, Mid-Continent area.

●

WELL EQUIPMENT MANUFACTURING CORPORATION
Houston, Texas

Booths Nos. 1224, 1226, and 1228 (Annex)

EXHIBIT: Equipment on display will include Weco unions, bull plugs, thread protectors, bronze bushings or seats for unions, flow tee, tubing disk, snatch and tong line blocks, stuffing boxes, derrick belt, oil saver, packing rings, gauge cocks and parts, steam drilling engine lubricators, slush pump lubricators, sight feeds, mud pump valves and seats, and other products used in the oil industry.

Real Fire low-pressure gas burners.

Thompson fusible plugs and steam gauge protector and parts.

Okadee valves.

Hamer plug valves, slush pump liner sleeves, and line blinds.

Representatives: C. K. Stillwagon, president and general manager; S. H. Smith, vice-president; E. L. Oliver, assistant sales manager; L. S. Hamer, Hamer Oil Tool Company; I. W. Hebner, Okadee Company; Lester O. Thompson, Boiler Equipment Company, and W. Clair Markle, Markle Tent and Awning Company.

●

WESTCOTT AND GREIS, INC.
Division of American Meter Company, Inc.
Tulsa, Oklahoma

Booths Nos. 726, 727, and 728

EXHIBIT: Positive displacement meters, flow meter, flow and proportional control, and remote recording and control, all products of the American Meter Company, Erie, Pennsylvania.

Back-pressure regulators, vacuum regulators, and liquid control, products of the Davis Regulator Company, Chicago, Illinois.

Orifice change fittings, products of the Robinson Orifice Fitting Company, Los Angeles, California.

House service regulators and gas reducing regulators, all of description made by both the Reliance Regulator Corporation, Alhambra, California, and the Chaplin-Fulton Manufacturing Company, Pittsburgh, Pennsylvania.

Automatic vacuum breaker valve for oil pipe-line work, product of Westcott and Greis, Inc., Tulsa, Oklahoma.

Water meters, and oil and gasoline meters, products of the Buffalo Meter Company, Buffalo, New York.

Representatives: J. H. Satterwhite, manager; H. W. Wahl, Dallas; C. C. Clover, Tulsa; R. A. Marsh, Houston; B. E. Keeling, Amarillo, Texas; Val Link, Jr., Shreveport; C. J. Elmer, Houston, and A. F. Benson, engineer of the American Meter Company, Erie, Pennsylvania.

●

WESTCOTT VALVE COMPANY
East St. Louis, Illinois

Exhibiting with Continental Supply Company.

EXHIBIT: The display will consist of hook-ups in which many of the unit parts will be sectionalized. Also, several valves for various pressures and in several sizes each sectionalized so that the action in opening and closing may be observed.

Representatives: W. C. Wadsworth, Tulsa, Oklahoma, representing Westcott in Oklahoma and Kansas; H. H. Tinch, Houston, Texas, representing Westcott in Texas and Louisiana; John E. Walker, representative from Shreveport, Louisiana; A. V. Wadsworth, vice-president, East St. Louis, and L. L. Scharf, treasurer, East St. Louis.

●

WESTERN METALS SPECIALTY COMPANY
Milwaukee, Wisconsin

Exhibiting in Mid-Continent Supply Company section.

●

WESTERN SAND-BANUM COMPANY
Houston, Texas

Exhibiting in American Sand-Banum Company section.

●

WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY
East Pittsburgh, Pennsylvania

Booths Nos. 1227 and 1229 (Annex)

EXHIBIT: Motors. A cutaway motor to show its construction, and another motor running under a spray of water to show its weatherproof feature. A gear-motor having a glass window over the gears so that they can be seen operating.

An operating model of a cutaway CSP transformer to illustrate how it completely protects itself from secondary overloads and lightning strokes.

A cutaway capacitor unit and a board to illustrate how capacitors can be used to save money by power factor correction.

A demonstration of a stroboscope on a stream of water. The stroboscopic effect obtained will make the stream of water appear to stand still or run back into the faucet.

A sample electric control for oil-field pumping, and a gear unit for pumping, the top half being removed.

Representatives: M. L. Donaldson, manager, Houston office; W. C. Carter, petroleum section, Houston office; W. C. Dreyer, petroleum engineer, Dallas office; R. A. Swindell, sales representative, Dallas office, and Q. M. Crater, manager petroleum section, East Pittsburgh Works.

●

WHEELING MACHINE PRODUCTS COMPANY
Wheeling, West Virginia

Booth No. 650

EXHIBIT: A general line of pipe couplings, pipe nipples, and other tubular goods will be displayed.

Representatives: E. W. Krause, president; Henry H. Paris, distributor, and A. J. Urban, salesman.

●

THE WHELAND COMPANY
Chattanooga, Tennessee

Exhibiting in Houston Oilfield Material Company section.

EXHIBIT: Will show one of the company's H-20000-AA duplex steam slush pumps and possibly a new 17½-in. oil bath rotary. The H-20000-AA steam slush pump is designed for high pressure, smooth operation, increased mud circulation, and reduced steam consumption. In size the pump is 15½ in. by 8 in. by 20 in. and is recommended by the manufacturer for operation at a maximum steam pressure of 350 lb. The steam end is of upside-down self-draining construction. According to the makers, the design of the pump provides for improved cushion, improved thermal efficiency, increased mean effective steam pressure, and elimination of broken rings and cylinder heads.

Representatives: E. F. Wheland, C. W. Wheland, G. E. Wheland, Geo. E. Campbell, chief engineer, and A. C. Willingham.

●

THE WHITE MOTOR COMPANY
Houston, Texas

Booths Nos. 1066-A and 1067-B (outside)

EXHIBIT: Oil-field trucks will be displayed.

Representatives: L. B. Hughes, district manager, Dallas, Texas; A. C. Newlon, branch manager, Houston, Texas, and J. B. Hallman, sales representative, Houston.

●

THE WHITNEY CHAIN AND MANUFACTURING COMPANY
Hartford, Connecticut

Booths Nos. 659 and 661

EXHIBIT: Power transmission drives, including roller and silent chains and sprockets, flexible couplings, and conveyor chain.

Representatives: W. H. Whitney, president; R. J. Howison, sales manager, and J. W. Anderson, Mid-Continent representative, Dallas, Texas.

●

WICKWIRE SPENCER STEEL COMPANY
New York, New York

Booths Nos. 359 and 361

EXHIBIT: Paneled display having illusion box, stressing increased service life and resulting lower costs from the use of Wickwire drilling lines and other ropes used in the oil industry.

Representatives: R. L. Foster, D. J. Henecker, K. A. Zollner, R. J. Jones, O. C. Elliott, and E. J. Daly.

●

WICO ELECTRIC COMPANY
Springfield, Massachusetts

Booth No. 657

EXHIBIT: A number of standard model magnetos, both the reciprocating and rotating types, will be displayed, although the feature of the exhibit will be the new Type C magneto. One of these magnetos will be in actual operation, having transparent housings, enabling the public to see the internal rotating parts.

Representatives: V. K. Hunt, sales manager, trade sales division; L. F. Smith, southwest district manager, and H. Lolley, sales department, Tulsa branch.

●

WILLIAMSPORT WIRE ROPE COMPANY
Williamsport, Pennsylvania

Exhibiting in Mid-Continent Supply Company section.

●

WILSON MANUFACTURING COMPANY, INC.
Wichita Falls, Texas

Booth No. 1045 (outside)

EXHIBIT: Wilson new model Giant and Mogul drilling rigs, which will feature the use of Wilson internal expanding, self-energizing friction clutches and new air-operated and manual controls, streamlined design, and many other new features. Also a new 6¾-in. by 12½-in. chain drive slush pump of entirely new design.

Representatives: John H. Wilson, Bert L. Ligon, Vann M. Ligon, and Mark T. Jordan.

●

WILSON PRODUCTS, INC.
Reading, Pennsylvania

Booth No. 748

EXHIBIT: A complete line of safety goggles having clear and welding lens in both spectacle and cup types. Also a complete

line of welding helmets and handshields, respiratory devices, which will include mechanical filter type respirators, air line respirators, and chemical cartridge type respirators. Will also display a few scientific instruments such as impinger outfits, thermo-anemometers, and chlorinated hydrocarbon combustion analyzers.

Representative: D. W. Hankins.

●

WILSON-SNYDER MANUFACTURING CORPORATION
Braddock, Pennsylvania

Exhibiting in Maintenance Engineering Corporation section.

●

WILSON SUPPLY COMPANY
Houston, Texas

Booths Nos. 234, 236, 238, 240, 339, and 341

EXHIBIT: The Nixon Gas-Lift Control System will be featured. Numerous other items of equipment also will be shown.

●

WILSON WELDER AND METALS COMPANY, INC.
North Bergen, New Jersey

Exhibiting with Air Reduction Sales Company.

EXHIBIT: Will display arc welders. Demonstrations of casing welding will be conducted using the electric-arc process.

Representatives: T. B. Hasler, and I. B. Yates.

●

WISCONSIN MOTOR CORPORATION
Milwaukee, Wisconsin

Exhibiting in Harley Sales Company section.

●

WITTE ENGINE WORKS
Kansas City, Missouri

Booth No. 1024-A (outside)

EXHIBIT: 3-kva. Witte vertical Dieselectric plant for automatic operation.

7½-kva. vertical Dieselectric plant electrically started.

9-hp. vertical Diesel engine having gas conversion equipment to operate on natural gas. This manually started unit is equipped with twin-disk clutch for power drive.

5-kva. Witte horizontal Dieselectric plant manually started.

8-hp. special gas-gasoline engine used for small pumping jobs. This unit is also manually started.

All Witte vertical units can be equipped for electric starting.

Representatives: P. E. Parker, chief engineer; C. B. Berry, sales department, and Dewey Phillips, factory representative.

●

W-K-M COMPANY, INC.
Houston, Texas

Booths Nos. 504, 506, 508, 510, 605, 607, 609, and 611 (Coliseum), and 1048 (outside)

EXHIBIT: Complete display of W-K-M through-conduit lubricated gate valves. Exclusive with the W-K-M valve design are the through-conduit opening having no seat cavities or other obstructions when the valve is in the open position, the use of the body and bonnet as grease reservoirs containing sufficient grease to last during years of service, the makers assert. These valves will be displayed in cutaway models, operating models, and assembled in Christmas trees.

W-K-M tubing slips and spiders in the regular type for wells to 3000-ft. depth, deep-well type for wells to 7000 ft. depth, and the new Series 12,000 models for wells to 12,000-ft. and 14,000-ft depths.

Hauser roller kelly drive, a device for drilling-in under pressure or with oil, using a joint of tubing or drill pipe as a kelly. The hinged body clamps around the pipe and has serrated rollers that rotate the pipe and permit free wheeling of the pipe either upward or downward.

W-K-M sucker rod hanger, a portable device suspending the sucker rod in the derrick on flexible chains that avoids damage and kinking caused by laying the rods on a walk.

W-K-M mud screen. This is a self-contained unit that is driven entirely by the flow of mud returns from the well, which operates a pelton wheel that in turn drives a large screening drum. Spiral vanes discharge the shale cutting from the front of the machine and clean mud is discharged from either side. The absence of high-speed operation or destructive vibration greatly prolongs the life of this unit, the makers state.

W-K-M rotary slips. The W-K-M Type 35 slip is a true friction slip. Dropped-forged segments are mounted in a steel cage that does not carry any strain but allows the segments to float independently to conform to any irregularities in the pipe or in the rotary table.

W-K-M King-Pin brake lining and brake band exchange. Especially compounded inserts are spaced at regular intervals throughout the lining. These inserts provide the necessary lubrication to avoid scoring of any type of band and also permit a smooth and even feed-off. W-K-M also offers brake band exchange service whereby new lined bands are shipped to the customer who in turn sends his old bands to the factory. In this manner the customer obtains instant service and avoids the usual shut-down time required for relining bands. He is also assured of bands that are properly shaped and lining that is properly installed.

A complete line of W-K-M pipe-line equipment will be displayed, which will include the new J-M coating and wrapping machine. Sales of W-K-M pipe-line equipment are handled by Crutcher-Rolfs-Cummings, Inc., Houston, Texas.

The W-K-M paraffin cutter is designed to remove thoroughly all paraffin from tubing. It is run on a wire line and cutter knives are so arranged that should the tool become overloaded, the spring-loaded knives will retract and permit the tool to be withdrawn. Likewise the cutters retract when going into the hole, which assures its passage through any tight spots that may be encountered.

The Everlasting Valve Company will display with W-K-M its complete line of blow-off valves and boiler-feed valves.

Likewise, the W-K-M Company will display the L-K cementing plug for which it is exclusive export distributor.

The Merco Centrifugal Company, San Francisco, California, will display the Merco centrifuge, a device for removing sand from drilling mud. This machine is also used for recovering mud weight material.

Representatives: The W-K-M display will be in charge of L. O. Koen, vice-president, and he will be assisted by T. M. Smith, H. B. Cookston, D. M. "Red" Griffith, F. M. Black, A. B. Calkins, and G. M. Finfrock. The Merco exhibit will be in charge of Al Peltzer, San Francisco. The Everlasting Valve Company exhibit will be in charge of E. N. Corning, Jersey City, New Jersey.

●

WORTHINGTON PUMP AND MACHINERY CORPORATION
Harrison, New Jersey

Exhibiting with A. M. Lockett and Company, Ltd.

●

WRIGHT MANUFACTURING DIVISION OF AMERICAN CHAIN AND CABLE COMPANY, INC.
York, Pennsylvania

Exhibiting with American Chain and Cable Company, Inc.

●

YARNALL-WARING COMPANY
Philadelphia, Pennsylvania

Exhibiting with M. N. Dannenbaum Company.

EXHIBIT: Yarway Impulse steam traps will be on display.

Representative: C. A. Cowles, Jr., Dallas representative.

●

YELLOW TRANSIT COMPANY
Oklahoma City, Oklahoma

Booth No. 1012-B (outside)

EXHIBIT: Will have on display one of the company's latest model Fruehauf van-type semi-trailers, to be equipped with telephone, desk, and chairs. Will also have one of the latest model Ford Cab-Over-Engine pick-up and delivery trucks.

Representatives: A. J. Harrell, president, Oklahoma City, Oklahoma; Evans A. Nash, vice-president, Oklahoma City; E. D. Hicks, superintendent of operations, Oklahoma City; A. A. Stein, terminal manager, Houston, Texas; R. H. Bills and T. A. Newby, commercial representatives, Houston.

●

J. E. YOUNG
Houston, Texas

Booth No. 1536 (Annex)

EXHIBIT: The folowing companies will have their products on exhibit:

Calmec Manufacturing Company, Ltd., Los Angeles, California, pump valves.

Kaye and MacDonald, Inc., West Orange, New Jerscy, steam traps.

Packing Engineering Corporation, Cranford, New Jersey, mechanical packing.

Representative: J. E. Young.

●

YOUNG RADIATOR COMPANY
Racine, Wisconsin

Exhibiting in Happy Belting Company section.

EXHIBIT: Standard jacket water cooler will be displayed.

Representative: W. R. Ramsaur, sales engineer.

●

YOUNGSTOWN SHEET AND TUBE COMPANY
Youngstown, Ohio

Exhibiting in Continental Supply Company section.

●

YOUNGSTOWN STEEL PRODUCTS COMPANY
Youngstown, Ohio

Exhibiting in Continental Supply Company section.

●

ZENITH CARBURETOR DIVISION OF BENDIX AVIATION CORPORATION

Exhibiting in Scintilla Magneto Company section.

●

JOHN ZINK COMPANY
Tulsa, Oklahoma

Booths Nos. 1513 and 1515-A

EXHIBIT: Products displayed will include: Bi-Mix short flame burners, combination gas and oil burners, low-pressure multi-jet Bi-Air burners, low-pressure heating burners, domestic burners, acid sludge burners, round flame outside mix and round flame inside mix steam atomizing oil burners; straightening vanes, Reid screen type, tubular type, cast-iron wing type; louver type oil and gas burners; mechanical atomizing oil burners.

Representatives: John Zink, James A. Morgan, S. F. Smith, and J. A. Moore.

●

ZUBLIN AND COMPANY
Dallas, Texas

Booths Nos. 305 and 307

EXHIBIT: Oil-well drilling bits.

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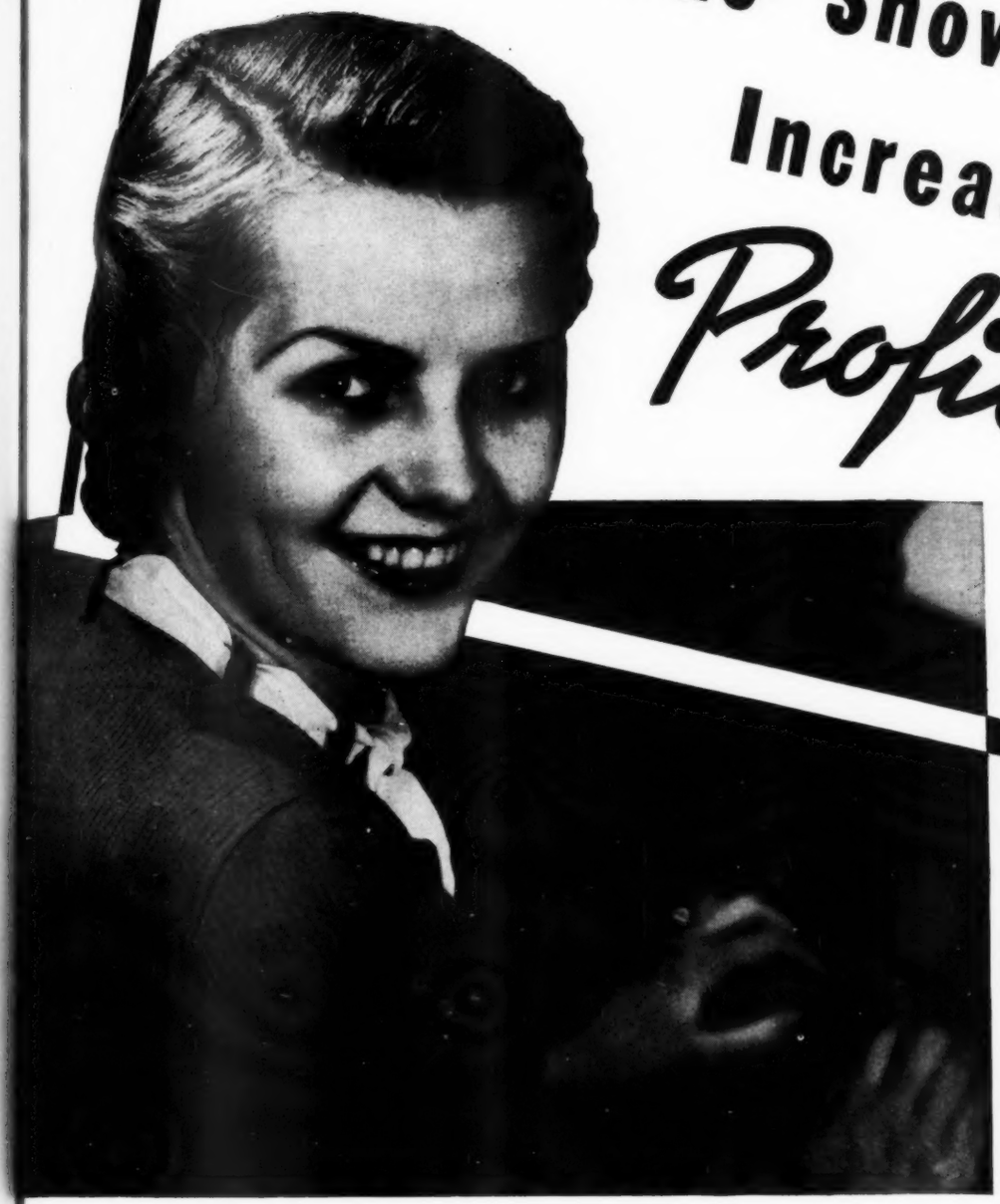

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What do office girls know about Purchased Electric Power? Merely this: They keep records of their company's oil production expenses, and from these records we learn the *exact* cost of Purchased Electric Power used for prime moving purposes.

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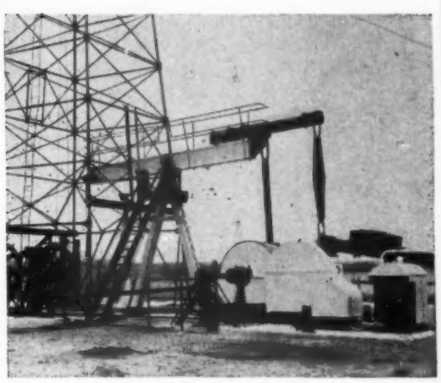

● Here is one of the many successful methods used for "lifting" oil by use of Purchased Electric Power. There's an electrically powered unit for any size job desired!

PETROLEUM ELECTRIC POWER CLUB

Determination of Salts in Crude Oil

PART 4

ANALYTICAL METHODS (Continued)

By

C. H. M. ROBERTS, Director of Research,

R. W. STENZEL, Research Staff, Long Beach Laboratory,

and W. F. EBERZ, Research Staff,

Petroleum Rectifying Company of California, Los Angeles

C. Determination of Acidity

It is of considerable interest to the refiner to determine if a crude oil is acidic and to measure the amount of such acidity. This acidity may in general be classified in two categories, viz: free acidity (strong and weak) and potential acidity. The latter is often of greatest interest, as it is measured by distillation and, therefore, more nearly approximates the acid generation in plant distillation equipment.

The presence of strong acids is usually the result of some process connected with production methods, such as the increasingly common practice of acidizing wells with hydrochloric acid, which leaves the residual brine particles in the oil highly acidic. Acidic treating agents used for demulsification of the crude oil may also be the source of some strong residual acidity.

Weak acidity is that represented by organic acids, such as the phenolic or naphthenic types, often found in considerable quantities in crude oil. Many refiners do not regard such acids as corrosive, and, therefore, are not interested in them from that standpoint.

Potential acidity is the strong acid (specifically hydrochloric acid) that is evolved upon distillation of the oil. The values obtained by laboratory distillation tests have been found by Davis, Jones, and Neilson[22†] to correlate well with actual refinery corrosion, so that the method they have proposed will undoubtedly grow in favor as a criterion for corrosion of distillation equipment. This method will determine not only the free volatile strong acids in the oil, but also hydrochloric acid formed by decomposition of the hydrolyzable chlorides, such as those of magnesium, iron, and calcium. As these substances are often present in appreciable quantities in crude oil, together with residual water, the distillation with steam to 650°F. is not unlike the conditions that the crude oil will encounter in the still, so the method appears to be a rational one to use for the purpose.

1. Potential Acidity—Steam Distillation Method. The method described by Davis, Jones, and Neilson (loc. cit.) involves a steam distillation of the oil, at a definite rate, to 650°F., and titration of the evolved hydrochloric acid either acidimetrically or as the chloride. In slightly modified form it has been used in this laboratory and found to give satisfactorily reproducible results. One of the modifications is in the separation of hydrogen sulphide from mercaptans, which will be further considered in the section on hydrogen sulphide evolution. The evolved acid was found to be most readily determined by use of the Volhard method for chloride, after the aqueous portion of the distillate has been boiled with a little perchloric acid to remove hydrogen sulphide. In order to avoid prolonged boiling it is desirable to oxidize the last traces of sulphide with a few drops of dilute potassium permanganate, removing the excess with a little oxalic acid. Test samples with known chloride content showed that this procedure caused no loss of HCl by volatilization. When only chloride is to be determined, no sodium hydroxide is used in the distillate receiver.

The results by this method on a sample of West Texas crude oil are shown in Table 9. Sample D876 was a "raw" crude (i.e., not de-salted), and sample D877 was the same stock after prefining by a commercial Petreco desalter. From Experiment 8 it is seen that the oil does not have an especially large chloride content (29.4 p.t.b. as NaCl), yet its hydrochloric acid evolution is considerable. When no steam is used in the distillation (Experiment 9) the evolution is reduced by 50 percent, showing the marked effect of the presence of water vapor on the decomposition of the acid-producing substance. Experiment 10 is interesting in that it indicates the presence of a source of HCl that is not readily removable by centrifuging. In most crude oils a reduction in the water content (cut) is accompanied by a directly proportional decrease in salt content, but in this instance removal of 98 percent of the water reduced the extractible chlorides by only 50 percent, and it reduced the evolvable HCl by only 33 percent. This suggests the possibility that some of the salt may be present as very fine microscopic crystals, or in some other form that does not permit precipitation by the usual centrifuging procedure (See Section B). The first is a likely possibility, as microscopic examination showed the presence of finely divided inorganic matter, most of which, however, was centrifugally separable.

Experiment 11 shows that the removal of the water by the centrifuging process reduces the acid evolution to a negligible value when no steam is used in the distillation, indicating definitely that the presence of water vapor is essential to the decomposition of the acid-producing compounds. In Experiments 12 and 18 the oil was thoroughly emulsified with distilled water, then

TABLE 9
Evolution of Hydrochloric Acid from Crude Oils

Exp. no.	Sample no.	Cut, percent	Treatment	Extractible chloride as HCl, (p.t.b.)	HCl evolved, p.t.b.
8	D876	0.4	Distilled to 650°F., with steam	18.3	12.6
9	D876	0.4	Distilled to 650°F., without steam	18.3	6.1
10	D876	.01	Centrifuged, dist. with steam	9.6	8.2
11	D876	.01	Centrifuged, dist. without steam	9.6	0.2
12 & 18	D876		Water-washed, dist. with steam	0.	0.6
13	D877	0.5	Distilled to 650°F., with steam	4.3	2.1
31	D877		Water-washed, dist. with steam	0.	0.3

†Numbers refer to articles listed at the end of this installment.

dehydrated and centrifuged before distillation. This, of course, removed virtually all the extractible chloride (the sensitivity of the chloride analysis is about 0.3 p.t.b.), but 0.6 p.t.b. of acid was still evolved even after this drastic procedure. These results are confirmed by Experiment 31, indicating that although this residual evolution is small, it is definitely beyond experimental error. Experiment 13 shows that the Petreco prefining process has removed 83 percent of the evolvable acidity.

In order to determine the specific effect of sodium, magnesium, and calcium chlorides on the acid evolution, the series of experiments tabulated in Tables 10 and 11 was performed. The crude oil was first thoroughly emulsified with distilled water, dehydrated, and centrifuged in order to remove as completely as possible the salts originally present. The quantities of salts added to the oils were approximately as follows: Magnesium chloride, 275 mg. of the hexahydrate (equiv. to 150 mg. anhydrous salt) for each charge of 500 ml.; calcium chloride, 150 mg. (anhydrous); sodium chloride, 150 mg. (anhydrous). These are equivalent to a salt concentration of 100 p.t.b., which is of the usual order of magnitude for sodium chloride, but somewhat large for calcium and magnesium. Experiment 14 indicates that the acid evolution from sodium chloride is of negligible proportions; on the other hand magnesium chloride is largely decomposed, which confirms the prevalent opinions regarding the corrosive effects of this salt. Experiments 16 and 21 show the marked effect of the state of dispersion in which the salt is originally present. In Experiment 16 the crystalline salt was merely finely ground and mixed with the oil before distillation, but in Experiment 21, 2.5 ml. of the salt in solution was thoroughly emulsified in the sample. The evolution of acid from the emulsified solution was 50 percent greater than from the other, which is significant, as in most oils distilled in the refinery the salts will actually be present in the form of very finely dispersed emulsion droplets. In Experiment 22 the oil was first de-salted by a dilute caustic solution in order to show the effect that extractible acidity may have on the acid evolution, but the result indicates that this effect is not significant. As the oil represented by Sample D877 was the same as that represented by D876 except for the commercial desalting treatment, the results on the two are directly comparable for those experiments in which they were first thoroughly water-washed, and no distinction between them has been made for purposes of the conclusions derived.

As crude oils may contain many constituents whose presence will affect the degree of hydrolysis of the salts, some experiments were made with a pure system. The sample used was a heavy U.S.P. medicinal oil (White Oil No. 7, Standard Oil Company of California). This oil shows no emulsifying properties, so that it was necessary to add a few drops of naphthenic acids for stabilizing the dispersion. Even this expedient, however, produced only a temporary emulsion so that the dispersion of the salts in the White Oil was undoubtedly less fine than in the crude oils. It can be seen that in the pure system (Experiments 36, 40) the hydrolysis was about 50 percent compared with 70 percent in the crude oil (Experiment 21). That this difference cannot be attributed to the lower distillate volume in the case of the purified oil can be seen by Experiment 38 in which kerosene in the proportion of 200 ml. to 300 ml. of the White Oil was added; the percentage hydrolysis was not greatly affected. Finer dispersion of the salt solution was produced in Experiment 39 by the addition of 2.5 ml. of the washed crude as emulsifying agent, but the hydrol-

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TABLE 10
Hydrolysis of Magnesium Chloride

Exp. no.	Sample	Preliminary treatment	Salt added: Kind	Amount, p.t.b.	Form	HCl evolved, p.t.b.	Hydrolysis, percent
12 & 18	D876	Water-washed	.....	none	.....	0.6	.....
14	D876	Water-washed	NaCl	100	grd.	0.4	0.
16	D876	Water-washed	$MgCl_2$	90	grd.	32.0	46.2
21	D876	Water-washed	$MgCl_2$	90	sol'n.	49.1	71.0
22	D876	Caustic-washed	$MgCl_2$	90	sol'n.	47.5	68.8
17	D876	Water-washed	105 NaCl	90 $MgCl_2$	grd.	25.4	36.8
19	D876	Water-washed	105 $CaCl_2$	90 $MgCl_2$	grd.	30.6	.....
31	D877	None	.....	none	.....	0.3	.....
45	D877	Water-washed	$MgCl_2$	9.8	sol'n.	6.9	91.6
32	D877	Water-washed	105 NaCl	90 $MgCl_2$	sol'n.	45.0	65.1
36	White Oil	None	$MgCl_2$	101	sol'n.*	39.4	50.8
40	White Oil	None	$MgCl_2$	101	sol'n.*	38.8	50.0
33	White Oil	None	105 NaCl	80 $MgCl_2$	sol'n.†	32.0	52.0
34	White Oil	None	105 NaCl	90 $MgCl_2$	sol'n.*	37.4	54.0
38	White Oil + Kerosene	None	$MgCl_2$	101	sol'n.*	42.0	54.1
39	White Oil	None	$MgCl_2$	101	sol'n.‡	40.6	52.4
43	White Oil + Kerosene	None (No steam)	$MgCl_2$	98	sol'n.*	12.3	16.4
42	White Oil	None	$MgCl_2$	9.8	sol'n.*	4.3	57.8
44	White Oil	None	$MgCl_2$	9.8	sol'n.*	4.0	53.8
46	White Oil	None (Extended distl'n)	$MgCl_2$	98	sol'n.*	38.9	51.7

*2.5 ml. of the solution emulsified with the aid of 0.5 ml. naphthenic acid.
†No naphthenic acids added.
‡Crude oil D876 (2.5 ml.) used as emulsifying agent.

ysis was still not appreciably altered.

Experiments 17, 32, 33, and 34 were performed to determine whether sodium chloride has any effect on the hydrolysis of magnesium chloride. The results are not entirely conclusive but if Experiment 17 in which the salts are added in solid form is discounted, as it should be, no very marked effect is apparent in either direction. (Compare Experiment 32 with 21, and 34 with 40). Similarly no definite conclusion regarding the effect of calcium chloride on the magnesium chloride decomposition can be reached from the results of Experiment 19.

When no steam is used in the distillation except that produced by the vaporization of the water used in adding the salts, the hydrolysis of mangesium chloride is only one-third as much as when steam is present (Experiment 43), which is similar to the results on the crude oil system (Experiment 9).

In Experiment 46 the time of distillation was extended 2.5 times the specified length in order to see whether the distillation rate was an important factor, but it appears to be entirely negligible over this range.

Another variable to be considered is the concentration of the salts in the oil. In Experiments 42 and 44 the quantity of magnesium chloride was only one-tenth that in the comparable Experiments 36 and 40, and it can be seen that the dilution had only a slight effect in increasing the hydrolysis. When the same dilution was used in crude oil, however, (Experiment 45) the hydrolysis was markedly increased, to 92 percent as compared with the 71 percent for the more concentrated solution of Experiment 21. A plausible explanation of these results seems to be as follows:

It is known that the basic magnesium chloride Mg_2OCl_2 is a very stable compound, so that the hydrolysis reaction may be written:

$$2MgCl_2 + H_2O = Mg_2OCl_2 + 2HCl$$

Thus when half the chloride has been hydrolyzed, as under the conditions of the distillation, the reaction may be expected to subside, at least until much more severe conditions are imposed. This hypothesis is supported by the 50 percent hydrolysis values obtained in the systems in which the purified oils were used. When a crude oil is employed, however, the hydrolysis may be considerably increased owing to the presence of acidic materials. The oxychloride is decomposed by the acid and if enough of the latter is present the reaction may even go to completion, so that 100 percent hydrolysis may occur. The reaction would be:

$$Mg_2OCl_2 + 4HX = 2\,MgX_2 + H_2O + 2HCl$$

where X is the negative radical of an acid of at least moderate strength. Thus the crude oil must contain sufficient acidic material to cause 90 percent hydrolysis when the magnesium chloride is present to the extent of 10 p.t.b., but not enough to cause the same degree of hydrolysis when ten times this quantity is present. The nearly 100 percent hydrolysis reported in the work by Davis et al., for the lower concentrations of magnesium chloride, indicates that his oil samples must have contained an appreciable amount of acidic material not extractible by his washing procedure.

It can be seen that the character of the oil is an important factor in determining the extent to which the acid-producing materials are decomposed under distillation conditions, so that a simple salt analysis can not be expected to give an accurate corrosivity picture, and must be supplemented by actual distillation tests.

EDITOR'S NOTE: This discussion of analytical methods of determining salt in crude oil will be continued in a future issue.

TABLE 11
Hydrolysis of Calcium Chloride

Exp. no.	Sample	Preliminary treatment	Salt added: Kind	Amount, p.t.b.	Form	HCl evolved, p.t.b.	Hydrolysis, percent
15	D876	Water-washed	$CaCl_2$	105	Ground	2.4	3.5
25	D876	Water-washed	$CaCl_2$	105	Solution	7.4	10.7
30	D877	Water-washed	$CaCl_2$	105	Pellet	1.0	1.4
28*	D877	Water-washed	$CaCl_2$	105	Solution	7.3	10.6
35	White Oil	None	$CaCl_2$	106	Solution†	1.1	1.6
37	White Oil + Kerosene	None	$CaCl_2$	106	Solution†	1.7	2.4

*Using 2.5 times normal steam rate.
†2.5 ml. of the solution emulsified in the oil with the aid of 0.5 ml. naphthenic acid.

[18]Caldwell and Moyer, *Ind. Eng. Chem.*, Anal. Ed., 7, 38 (1935).

[21]Sheen and Kahler, *Ind. Eng. Chem.*, Anal. Ed., 8, 127 (1936).

[22]Davis, Jones, and Neilson, *Oil and Gas Journal*, May 26, 62 (1938); *Refiner and Natural Gasoline Manufacturer*, 17, 271 (June, 1938).

Running Tour
WITH MEN IN THE INDUSTRY

WILLIAM O. LIGON III, Tulsa, Oklahoma, member of the Oil Well Improvements Company staff, was married recently to Miss Jane Whitmore of Valley, Nebraska.

T. J. SCHUETZ, president of the Braden Winch Company, recently left Tulsa, Oklahoma, for a 10-day business trip to Texas.

JACK BARNES, petroleum engineer with the Trinity Portland Cement Company, who has been stationed at Longview, Texas, has been transferred to Corpus Christi.

ERNESTO ESCOBAR, inspector general of mines for the government of Ecuador, has just returned to La Libertad, Ecuador, after spending some time in the California fields studying methods of operation.

JOHNSTON DE FOREST has been elected to the directorate of Tide Water-Associated Oil Company to fill the vacancy created by the death of his uncle, Henry W. de Forest, who passed away several months ago.

CLEM EIFERT, formerly drilling superintendent for Nath Singh Oil Company, is now in Los Angeles, California.

L. BRODERSEN, foreman of the valve machine shops of Manning, Maxwell and Moore, Inc., Bridgeport, Connecticut, recently visited the Tulsa, Oklahoma, office of the company. Accompanied by **MALCOLM BLACK,** southwestern sales manager, he also spent some time in the Oklahoma City field. This was Brodersen's first visit to the Mid-Continent area.

C. A. PETRIE, driller for the Burmah Oil Company, who has been visiting in California, has returned to Burma.

R. E. CURRAN, driller with Burmah Oil Company, has just returned to Burma via San Francisco after spending some time in California.

ALFRED E. BALLIN has opened consulting engineering offices in the Philtower Building, Tulsa, Oklahoma.

COL. W. F. ROCKWELL, president of the Pittsburgh Equitable Meter Company, recently announced that **CAPT. A. E. HIGGINS,** a vice-president of the firm, had been placed

CAPT. A. E. HIGGINS

in charge of sales for both the Pittsburgh Equitable Meter Company and its subsidiary, the Merco Nordstrom Valve Company.

Before he became associated with the Pittsburgh Equitable Meter Company, Capt. Higgins was secretary of the Natural Gas Section of the American Gas Association. He has long been a prominent figure in the gas industry.

ISRAEL MEDVEDZKY, drilling superintendent for Palestine Water Company, is in the United States for the purpose of studying American oil equipment. He has been in California during the last month.

VIC WANKOWSKI, engineer with the Standard Oil Company of California, recently left Bakersfield for Alaska.

H. W. HAKE, of the Hake Tool Company, Houston, Texas, announces the appointment of **P. D. LONG** as representative in Louisiana, having headquarters at Shreveport, and **J. L. RICHARDSON** as representative in eastern fields.

Both Long and Richardson are well known to oil men in the Mid-Continent and Gulf Coast fields, having been connected with various manufacturers and supply houses in those territories for several years. Long recently has been identified with Emsco Derrick and Equipment Company in East Texas.

DAN P. MURPHY, tool pusher with Tropical Oil Company in Colombia, has been in Los Angeles, California, on vacation.

JACK STOVALL, who for the last eight years has been connected with the Globe Oil Tools Company, recently transferred his headquarters to Houston, Texas, where he will serve as special field representative for the company in order to coöperate more closely with the Hake Tool Company in the sale and distribution of Globe drilling, reaming, and coring tools. For the present he will be at the Hake Tool Company offices, 1121 Rothwell Street.

DORSEY HAGER, Centralia, Illinois, consulting geologist and petroleum engineer, talked before the St. Louis section of the A.I.M.E. March 24 on "The Evaluation of Oil Developments in Illinois, Northern Missouri, and Southern Iowa." Hager discussed developments to date in Illinois and in the Forest City Basin area of Missouri and Iowa, outlining possible new areas in Illinois, and the basis for the hope of new fields in the Forest City Basin area.

V. W. FLETCHER, storekeeper for the Caribbean Petroleum Company, is now in Los Angeles, California, on vacation but will soon be returning to Venezuela.

J. C. HARRIS has been made district manager for Illinois by the Iverson Tool Company, Tulsa, Oklahoma. His headquarters are at Salem.

DANA G. GRIFFIN

DANA G. GRIFFIN, field salesman for Atlas Supply Company at Gladewater, Texas, has been transferred to the Tulsa office as sales engineer. Griffin completed his mechanical engineering work at Georgia Tech in 1928. For the next eight years he designed and installed Bruce-McBeth gas engine installations throughout the state of Texas. He worked for Frick-Reid Supply Corporation as power builder for 18 months before joining the Atlas Supply organization at Gladewater, December 1, 1937.

R. L. "BOB" EASLEY of the Houston, Texas, branch of Petroleum Rectifying Company of California, left recently via Pan American Airways for Venezuela on the first leg of a tour of inspection of Petreco Electromatic Dehydration Plants in the various oil-producing countries of South America, which will extend over a period of several months. While there he also will supervise the installation of a number of new plants that have been shipped from Los Angeles during the last few months.

ESTEBAN VOICULESCO DI-OSTI, exploration engineer for Astra Romana, has been in Los Angeles, California, on vacation.

HAROLD B. SCHUM, formerly assistant treasurer of the Hope Natural Gas Company and subsidiaries, has recently been elected president of the River Gas Company, Marietta, Ohio. **J. C. CROSS,** manager of the accounting department of Hope Natural Gas Company, Pittsburgh, Pennsylvania, will succeed Schum.

HOMER McDUFF, drilling superintendent for Standard Oil Company of Venezuela, is visiting the Mid-Continent area.

RODNEY S. DURKEE, executive vice-president of the Lane-Wells Company, Los Angeles, California, is in the St. Joseph's Hospital, Santa Ana, California, recovering from an appendectomy. Durkee recently completed an extensive trip to the company's branches in the Mid-Continent and the Gulf Coast areas and had just returned from New York City. Reports from the Los Angeles office of the Lane-Wells Company are that he is expected back at his desk within a short time.

RAY PERRY and **VAN J. SCOTT,** drillers, have recently left for Iraq where they will work for the Iraq Petroleum Company.

HARRY E. COOPER of Fred E. Cooper, Tulsa, Oklahoma, oil field distributors for Allis-Chalmers winches and tractors, will return in May from Eastern Hemisphere oil fields. He has been on the trip since last August.

JACK COLEMAN, driller, left on March 30th for Egypt where he will work for Socony-Vacuum Oil Company, Ltd.

JOHN SLOAN, independent producer of Bradford, Pennsylvania, recently made a tour of the Mid-Continent area and California fields.

VAN H. SULLIVAN, petroleum engineer for the Texas Petroleum Company, left Los Angeles, California, recent for Colombia.

FRANK LYONS, Ohio operator, was in the Lethbridge and Taber fields, Alberta, Canada, recently planning a drilling program.

R. B. STANDEFER, drilling advisor with the Caribbean Petroleum Company, spent a short vacation in Los Angeles with his bride.

WARREN SKELTON, oil operator of Thermopolis, Wyoming, has been appointed Wyoming State Mineral Supervisor by **GOVERNOR NELS SMITH.** He succeeds **PIERRE LA FLEICHE.**

H. A. WIENECKE, JR., sales engineer of the Gaso Pump and Burner Manufacturing Company, Tulsa, Oklahoma, spent about ten days recently in looking over the new development in the state of Michigan.

J. G. UMPLEBY

L. W. FAGG

L. W. FAGG, a graduate of the engineering school at Oklahoma A. & M., has recently been made Tulsa district representative for The S. M. Jones Company. Fagg was formerly in charge of the S. M. Jones Company's activities at Oklahoma City and previously was connected with the company's field engineering department.

The company has also announced the appointment of **GRAY UMPLEBY** as Illinois district representative having headquarters in Salem. Umpleby is a graduate of the Missouri School of Mines, where he completed a petroleum engineering course begun at Oklahoma University and for some time has been associated with the field engineering work of the Jones company.

GEORGE J. HELFRICH, who has been associated with the company since 1925, has been appointed district sales manager of the Chicago territory of the Reading-Pratt and Cady Division of American Chain and Cable Company, Inc., having headquarters at 400 West Madison Street, Chicago, Illinois.

A. E. ENGLEBRIGHT, superintendent of the gas department, North Bay Division, Pacific Gas and Electric Company at San Rafael, California, has recently accepted a position as natural gas engineer with Ebasco Services, Inc., in New York City. In his new position, Englebright will act as advisor to the Electric Bond and Share Company concerning the many natural gas properties.

WENTHROP HAYNES, chief geologist, Standard Oil Company of New Jersey, recently acted as host to several distinguished geologists from European countries in a tour of the Mid-Continent area. Among those in the party were **DR. SIMON PAPP,** chief geologist of the Hungarian-American Oil Company at Budapest, and **FRITZ KASELITZ** of Romana Americana Oil Company at Bucharest.

K. F. DANIEL, of the Caribbean Petroleum Company, and Mrs. Daniel are spending their vacation in Los Angeles, California.

G. M. STEWART

G. M. STEWART has been appointed export manager in charge of foreign sales by the W-K-M Company, Inc., Houston, Texas, succeeding **T. L. PUTMAN,** resigned. Stewart was formerly with the W-K-M Company, and more recently with one of the major oil companies in Venezuela. Since 1926, the W-K-M Company has maintained its own export office and personnel in New York, and to facilitate the management of export business, will have resident salesmen in active foreign fields. The W-K-M export office is at 74 Trinity Place, Room 1709, New York.

W. B. BERWALD

W. B. BERWALD, who left the U. S. Bureau of Mines recently to join the engineering staff of the Ohio Oil Company, Tulsa, Oklahoma, graduated in 1924 from the School of Mines, University of Pittsburgh, with a degree in petroleum engineering. After graduation he worked for the Bradford Gasoline Company in the Bradford field until 1926. He entered the employ of the U. S. Bureau of Mines at Bartlesville in February of that year and at the time of his resignation was in charge of production engineering research work. With the Ohio Oil Company he is in charge of the company's petroleum engineering work in Oklahoma, Kansas, Arkansas, North Louisiana, and East Texas.

W. H. LANDRETH, chairman of the board of Landreth Production Company, died recently at his home in Joplin, Missouri. The deceased was a brother of **E. A. LANDRETH,** Fort Worth, Texas, president of the Landreth Production Company.

L. C. "LEW" KLEIN, formerly manager at Tulsa, Oklahoma, for the Titusville Iron Works, has been named South American representative of the O.C.S. Manufacturing Company, Coffeyville, Kansas.

LESTER C. UREN, professor of petroleum engineering, University of California, Berkeley, California, is now reading proofs on his new volume "Oil Field Exploitation", which will discuss in detail the producing phases of the industry. It is a book containing approximately 675 pages and 400 illustrations. The McGraw-Hill Book Company is the publisher and it is expected the volume will be off the presses in May.

C. A. SHACKLETTE has been appointed sales representative in southern Illinois and western Kentucky for the Union Wire Rope Corporation, Kansas City, Missouri. His headquarters are at 1000 Locust Street, Ownesboro, Kentucky.

You Get Better Field Coatings **with Armco Pipe**

To be of any value a field coating must *stay on the pipe.* That's one reason why thrifty oil companies everywhere prefer Armco Spiral Welded Pipe. Each section is "*shot-blasted*" on the outside before mill priming to remove all dirt and mill scale. This helps reduce corrosion hazards and provides a lasting bond for primer and field coats.

Also, when you use Armco Spiral Welded Pipe, cost estimates are more accurate and bid prices are likely to be lower. This is because Armco Pipe comes in *uniform* lengths (up to 50 feet) that eliminate guesswork. Then too, it can be field welded faster and more economically than other types.

You'll find a diameter and wall thickness of Armco Pipe exactly suited to your needs. Just write, phone or wire our nearest office for prices and reliable delivery promises. The American Rolling Mill Co., Pipe Sales Division, Middletown, Ohio; 538 Mayo Building, Tulsa, Okla.; 3500 Maury St., Houston, Texas.

ARMCO

ARMCO

SPIRAL WELDED PIPE

LINE PIPE AND SURFACE CASING

LAUGH WITH BARNEY

Edited by BARNEY HORRIGAN

The usual group of New Englanders, New York bound on the night boat, stood by the rail watching the changing skyline of New York as they approached the city the other morning. When the Statue of Liberty came into view, the exclamation was overheard: "What a small light for such a big statue!" And we wonder what experience prompted some young lady to chirp up with: "The less light, the more liberty.

It's not so easy to interpret a vacation postcard which reads: "Wish you were here. Going to leave in the morning."

A negro was telling his minister that he had "got religion."

"Dat's fine, brothah, but is you sure you is goin' to lay aside sin?" asked the minister.

"Yessuh!"

"An', is you gwine to support de church and help de widows and de orphans?"

"Ready right now."

"An' is you gwine to pay up all yoh debts?"

"Wait a minute, pahson! You ain't talkin' religion now—you is talkin' business."

An American went down into a London restaurant and sat down at a table.

He: What's good today?

Waitress: Rhubarb, rutabagas, ravioli, rice and roast.

He: My! You certainly roll your r's.

Waitress: Maybe it's these high heels I'm wearing.

The department of taxation received a typed income tax return from a bachelor who listed one dependent son. The examiner returned the blank with a penciled notation: "This must be a stenographic error."

Presently back came the blank with an added pencil notation: "You're telling me."

"Well, Jerry finally married that terrible red head."

"What got into him?"

"Buckshot."

She: Let's go places and do things.

He: Do we have to go place?

"I want to know," said the grim-faced woman, "how much money my husband drew out of the bank just before Christmas."

"I cannot give you that information, madam," answered the man in the cage.

"You're the paying teller, aren't you?"

"Yes, but I'm not the telling payer."

There's the story of the housewife who shipped a package of home-cooked food to her daughter in another city. On the wrapper she wrote: "If not delivered in ten days, never mind."

Voice (over telephone): Are you the game warden?

Game Warden: Yes, ma'am.

Voice: Well, I am so thankful I have the right person at last! Would you mind suggesting some games suitable for a children's party?

About the three turtles who decided to have a cup of coffee? Just as they went into the pub it started to rain, so the biggest turtle said to the littlest turtle: "Go home and get the umbrella." So the little one said: "I will, if you don't drink my coffee." "We won't," promised the other two.

Two years later the big turtle said to the middle turtle: "Well, I guess he isn't coming back so we might as well drink his coffee." And when he said that, a little voice called from just outside the door: "If you do, I won't go."

And then there's the one about the lady who went on a hunger strike—and twenty Scotchmen proposed to her.

Anyone who thinks advertising doesn't pay should remember that Colorado has 26 mountains higher than Pike's Peak.

An economist has computed that the depression has cost us some $133,000,000,000. That's a lot of money to spend for so little fun.

Friend: I see you are driving a new car.

Insurance Agent: Yes, I tried to sell an insurance policy to an automobile salesman.

Rusty's girl is so dumb she think's he's a dimwit because he is so amusing in the dark.

And then there was the Scotchman who was the father of 23 children. Great Scott!

Rastus was in trouble again, and the Judge asked him if he were guilty or not guilty. "Guilty, suh, I think, but I'd rather be tried to make sure of it."

Reformer: Pardon me, young lady, but in the matter of dress, don't you think you could show a little more discretion?

Flapper: My gosh, some of you guys ain't ever satisfied.

He (after sitting in a parked car for an hour): You know, sweetheart, I am a mind reader.

She (sarcastically): I know better.

The old-fashioned girl who blushed when she was ashamed now has a daughter who is ashamed when she blushes.

The members of the missionary society were turning in the dollars each had earned. "I got mine from my husband," said Mrs. Brown. "But that's not earning it," remonstrated the pastor. "No?" asked Mrs. Brown. "Then you don't know my husband."

"Mrs. O'Toole," said the iceman, "as my route has been changed I'm going to have to make you an hour later from today on."

Many a rural romance has started on a gallon of corn and ended with a full crib.

"I hold hands for a living."

"Oh, a gigolo?"

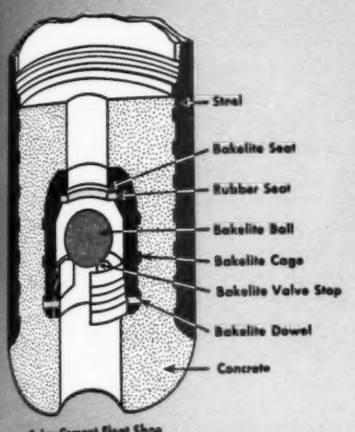
"No, card shark."

They tell us in one Mohammedian country, that when a man under 50 dies, they bury him in the sand for 48 hours and then put him in a room with seven beautiful girls, lying on beds of roses.

Why?

Answer: If he doesn't wake up then, they KNOW he's dead.

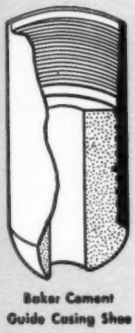
Peace of Mind



Baker Cement Float Shoe

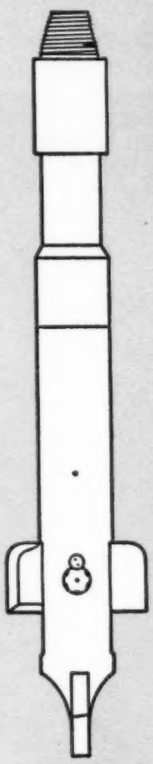
Baker Cement Float Collar

Baker Cement Whirler Float Collar with Solid Bottom Baffle, with Metal "Petal" Basket

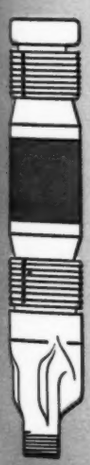


Baker Cement Guide Casing Shoe

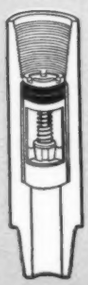
Baker Cement Wash-Down Whirler Float Shoe



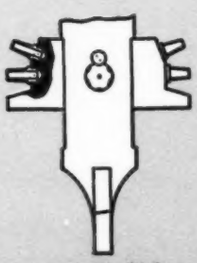
Baker Rotary Wall Scraper



Baker Model "K" Cement Retainer



Baker Bakwik Model "B" Drill Pipe Float



Lower Section of Baker Rotary Wall Sampler

A "HIDDEN VALUE" That Costs You Nothing, Yet Means So Much

As superintendents and crews well know, this business of drilling oil wells is a fast moving, high tension game . . . where anything can happen and frequently does. The responsibility is great and enough "natural" hazards are encountered without the supervising personnel having to worry about the safety and performance of the tools they use.

This is just ***another*** reason why Baker equipment is the first choice of practical oil men. They know from long experience that every tool or device bearing the name "Baker" will ***Safely, Efficiently and Economically*** do the job for which it was designed.

Thus, coincident with the use of Baker "Practical and Dependable" Oil Tools comes reassurance and Peace of Mind, a ***"Hidden Baker Value" that costs nothing,*** yet means so much.

BAKER OIL TOOLS, INC.
HUNTINGTON PARK, CALIFORNIA
HOUSTON, TEXAS

BAKER OIL TOOLS

"Practical and Dependable"

MACHINERY and EQUIPMENT

Castable Refractory by Johns-Manville

AS A RESULT of its recent development work on castable refractories, Johns-Manville, New York City, announces a new light-weight Firecrete for making special refractory shapes, for replacing difficult brick construction, for lining furnace doors, and for making small monolithic linings. The new product is suitable for working temperatures to 2200° F.

Accepted laboratory and service tests have shown that this latest addition to J-M's line of Firecrete products possesses an exceptionally low heat storage capacity, the makers state. This is of special importance in intermittently operated furnaces, as appreciable quantities of heat are wasted in heating heavy fire brick and then allowing the furnace to cool. Light-weight Firecrete has been shown to be four times as effective as fire brick in retarding heat, although having only half its weight, it is asserted. Also, its resistance to spalling is such that it will withstand direct exposure to flame temperatures.

Sixty-five pounds of the material are required per cu. ft. of finished construction. It can be used to form any required refractory shape. This is accomplished within a short time simply by mixing light-weight Firecrete with water and casting it into a form. Twenty-four hours later the shape is ready to be placed in service.

Small Twin-Crank Pumping Unit Features Rigid Base and Samson Post

THE new "Oilwell" TC-5 Pumping Unit has been developed by Oil Well Supply Company, Dallas, Texas, to provide a shallow-well unit

that combines dependable and efficient performance with low-installed cost. It is a portable, self-contained, twin-crank unit of 5000-lb. polished-rod capacity. Stroke lengths are 16, 18, 20½, and 24 in. Peak torque capacity at 20 s.p.m. is 22,500 in-lb.

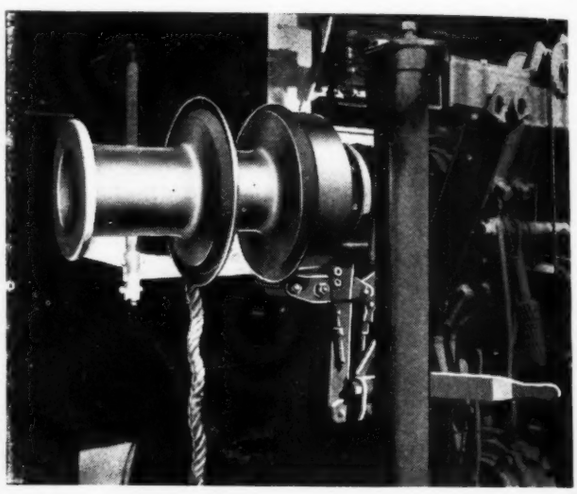
Of particular interest is the structural-steel frame, consisting of a rigid, widespread base and a high samson post of the four-leg, derrick type, a construction usually found only in pumping units designed for heavy-duty service. The base is of rectangular shape and is without overhang at the sides. Universal slide rails facilitate mounting various types of prime movers on the base. An arc-type hanger assures straight polished-rod lift.

The speed reducer is equipped with single-helical, double-reduction gears providing a ratio of 32:1, which facilitates the use of low-priced, high-speed prime movers. All speed reducer shafts rotate in tapered roller bearings, crank pins are equipped with self-aligning, spherical roller bearings, and the upper pitman and saddle bearings are bronze-bushed. Oil seals retain lubricant in all bearings.

The TC-5 Pumping Unit is described in "Oilwell" Bulletin No. 180.

Safety Cathead for Spinning Lines

SHAFFER Specialty Company, Tulsa, Oklahoma, announces a new safety spinning line cathead that is operated by a remote-control lever. The makers assert the device actually prevents accidents. The operator does not handle the line and the mere releasing of the lever causes positive, instant disengagement of the cathead, automatically slacking-off the line.



The safety cathead perform all functions of the conventional cathead with absolute safety to the operator and increases the efficiency of the drilling crew, it is stated. Friction clutches are engaged and disengaged manually by a remote-control lever placed at driller's position. As the operator does not handle the spinning line, the hazard of spinning-line operations is eliminated.

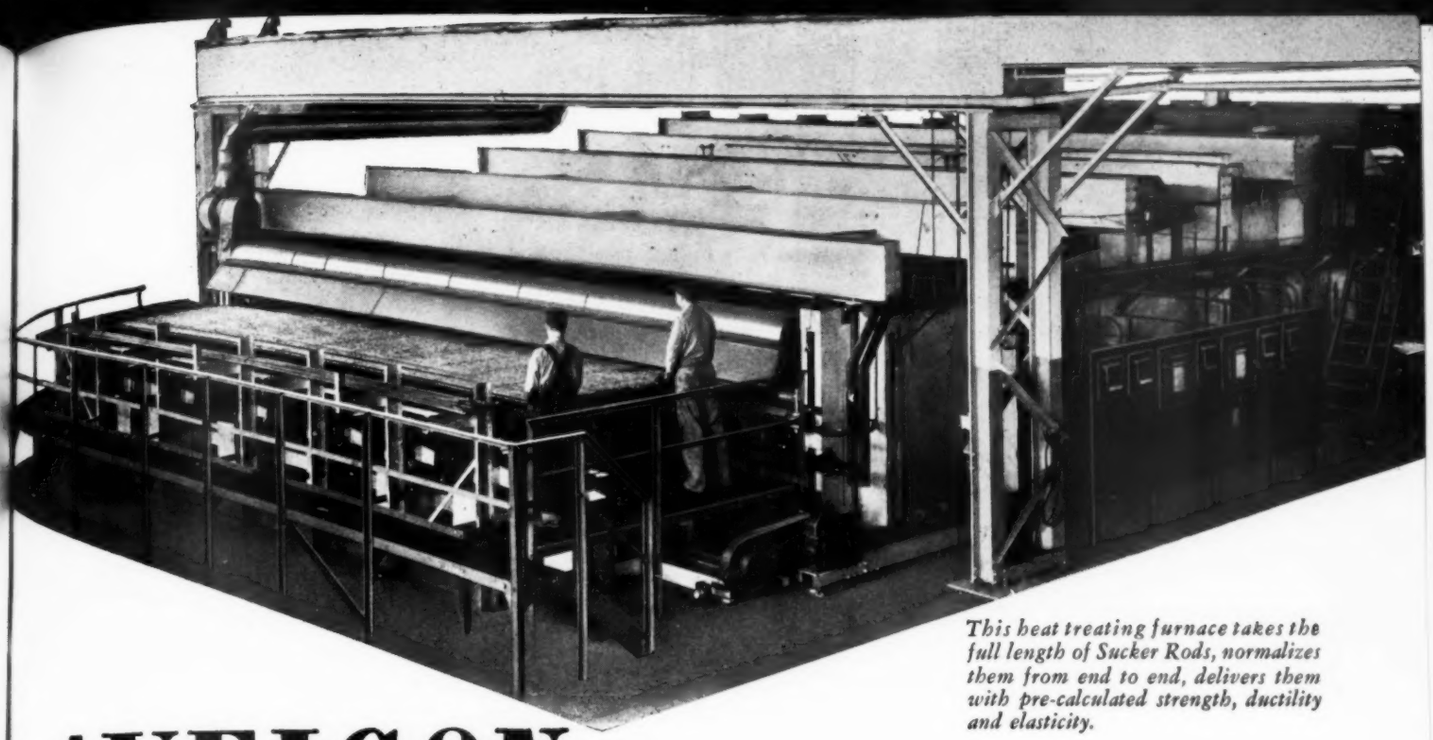
Both spining line and tong line are incorporated in a single rope by use of a "forked" spinning end. One end of the fork spins the pipe, the other is permanently attached to the tong handle, accomplishing the spinning and tonging of pipe with a single line.

The device fits any drawworks and a flanged hub is provided for mounting on the drawworks lineshaft.

The safety cathead is not limited to rotary drilling. When used with tubing hoists it not only provides safe operation but increases the efficiency of the crew by speeding-up operations and minimizing the use of tongs, it is asserted.

Lever brackets are installed on the drawworks jack post and the spinning drum is mounted on a roller bearing that is free rolling.

Shaffer also announces a conventional cathead in combination with the spinning drum for pick-up work.



This heat treating furnace takes the full length of Sucker Rods, normalizes them from end to end, delivers them with pre-calculated strength, ductility and elasticity.

AXELSON USES THESE MACHINES FOR YOUR BENEFIT

The total stretch in an average string of sucker rods amounts to more than ten miles a day. A thousand times an hour the lift and drop put a tremendous strain on the thin line of steel. Every inch of it must be able to take it—for days—months—years.

Axelson invests thousands of dollars in equipment to perform one heat treating operation to lengthen the life of Sucker Rods. More thousands of dollars are invested in testing machines to give positive facts about tensile strength, elasticity and every physical characteristic before the rods leave the plant.

You think of a Sucker Rod as a simple bar of steel. Axelson Sucker Rods are more than that. They embody years of research on the chemistry of steel, the type of threads, the method of upsetting the forged ends, the heat treatment of the entire rod, the hardening of the coupling and many other details.

These protective operations are not simple, but they are needed to simplify your pumping problems and reduce your cost of production.

THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

AXELSON MANUFACTURING CO.

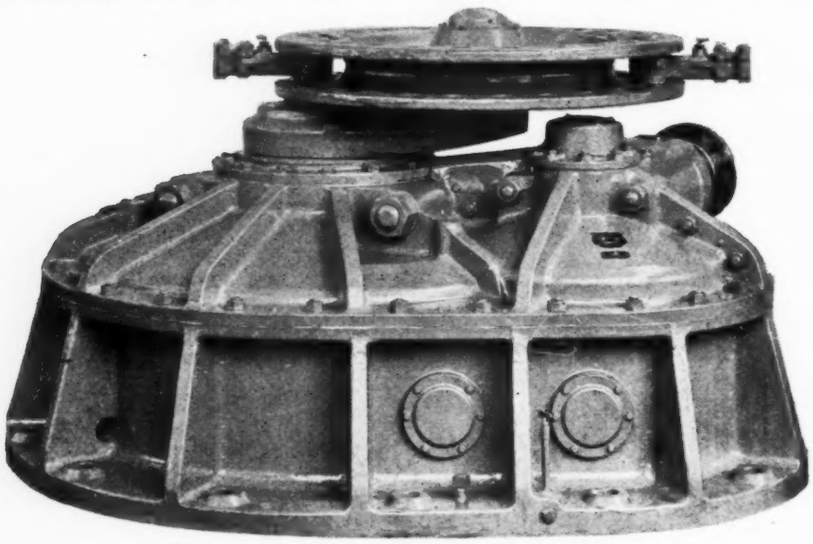
P.O. Box 98, Vernon Station, Los Angeles • St. Louis • 50 Church St., New York • Tulsa • Mid-Continent and Eastern Distributor: Frick-Reid Supply Corp. • Rocky Mountain Distributor: Great Northern Tool & Supply Co. • Foreign Representatives: "COSMOS" Soc. in Nume Colectiv, Bucharest, Roumania • Direct Factory Representative, Bucharest, Roumania • Industrial Agencies, Ltd., San Fernando, Trinidad, British West Indies • Factory Representative, Maracaibo, Venezuela • Armco International Corp., Buenos Aires, Argentina.

WRITE TODAY for a copy of this 62-page book that tells how Axelson Sucker Rods are made and why.

Axelson testing equipment gives the answer to every question that can be asked about Sucker Rod quality and leads to improvements that lengthen Axelson Sucker Rod life.

National Pumping Power Type G-150-B

THE National Supply Company, Toledo, Ohio, has developed a new and larger National Geared Power, known as the Type G-150-B, which is made for the heaviest requirements of central-power pumping. The general design is the same as the Types G-30-B, G-50-B, G-75-B, and G-100-B National Geared Powers. Nominal hp. rating is 144 and A.P.I. peak torque rating is 714,500 in-lb. at 20 s.p.m. Available stroke lengths range from 30 to 40 in.



The National rotating shaft design used on all National Geared Powers, including the Type G-150-B, brings the pull-rod load close to the case and allows an unusually wide spacing of rotating shaft bearings. This construction is particularly effective in preventing harmful effects from heavy well loads and maintaining the rotating shaft in alignment. In addition, the case is used to support the load close to the pull rod itself, the load of the upper bearing being carried by the heavy reinforced upper half of the case.

A feature of the Type G-150-B, in common with all Type G National Geared Powers, is the accessibility to the inside of the case for inspection without the necessity of removing the crank or power disk or disturbing the alignment of the gearing. The upper half of the case is split for this purpose. Other features include an adjustable stroke procured by five different positions of an adjustable crank pin.

Complete details are included in National Descriptive Bulletin No. 235.

Straight-Lift Underpull Jack

ALLIED Steel Products Corporation, 1407 North Peoria Street, Tulsa, Oklahoma, in announcing its straight-lift underpull jack, says the knowledge and experience of many production engineers and superintendents were utilized to assure correct design. The jack is said to give long life of economical and dependable service. Straight lift is obtained by three centers of adjustment, which apply individually to beam-head assembly, horsehead, and wire lines. The unit is electric welded throughout and assembled on specially designed, permanent jigs and fixtures.

Literature descriptive of the Allied straight-lift underpull jack gives information on production methods, costs, data on rod stretch, etc. The book is free upon request.

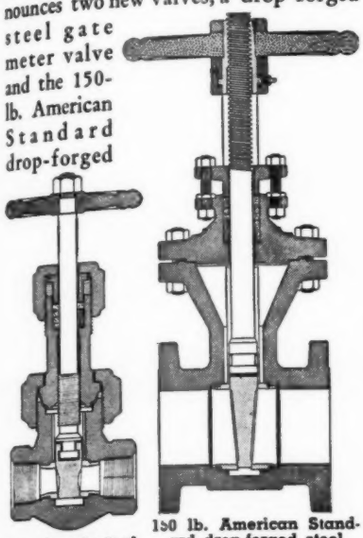
G-E Small Snap-Action Limit Switch

DESIGNED for use on machine tools, conveyors, and other automatic equipment, a small, snap-action limit switch recently announced by General Electric Company, Schenectady, New York, has the advantage of being so constructed that it can be easily mounted for operation in virtually any position. The new device was developed to meet a need among machine designers and users for an inexpensive limit switch that not only would be small in size but would also operate slowly without burning of contacts and would be protected against oil and dirt around a machine, the manufacturers state.

This switch is enclosed in a sturdy die-cast case, drilled to facilitate mounting on back or either side. Silver-to-silver double-break contacts assure long life and two independent circuits provide any contact arrangement. Positive snap-action is obtained by means of an over-center toggle mechanism. The switch can be supplied with either a roller-lever or push-rod head. A gasketed cover and grease seals on the push-rod and shaft make it oil-proof. Ample space inside the enclosure, as well as easily accessible terminals, permit rapid and simple installation.

Two Valves by Vogt

HENRY VOGT Machine Company, Louisville, Kentucky, announces two new valves, a drop-forged steel gate meter valve and the 150-lb. American Standard drop-forged steel gate valve. The drop-forged steel gate meter valves are of the union bonnet, ground joint, and inside screw stem type having removable rolled-in seats and a loose, slotted gate. They are made in the ¼-in., ⅜-in., ½-in., ¾-in., and 1-in. sizes of carbon steel having stainless steel trim or of all-stainless steel, as required by the particular operating conditions.



Drop-forged steel gate meter valves

150 lb. American Standard drop-forged steel gate valve

The new line of 150-lb. American Standard drop-forged steel gate valves features the following: Body and bonnet flanges are forged integral, the bonnet flanges are of the round bolted type, and there is a full port opening through the valve.

All valves have slotted gates and rolled-in seats. A gasket joint is between the body and bonnet. The valve is made in 2-in., 2½-in., 3-in., 4-in., 6-in., and 8-in. sizes, having stainless steel trimmings. Working pressure is 150 lb. at temperatures to 500°F.; the cold working pressure is 230 lb.

Burst-Proof Steam Hose

A NEW burst-proof steam hose has been introduced by The B. F. Goodrich Company, Akron, Ohio, which is said to make for prolonged life in service. The tube of the hose is made from an improved compound possessing great heat-resisting properties and its capacity to resist steam penetration into the hose carcass and through the cover is vastly superior to compounds previously used, the makers assert.

For sizes 1¼ in. and larger, one ply of strong asbestos woven fabric and a spiral wire reinforcement are placed between the wire braids. Tests show that asbestos fabric serves to a better advantage on the larger hose sizes, as the asbestos is a slow conductor of heat and when combined in this construction will prolong the life of the hose, it is stated. Use of a spiral reinforcement prevents, to a marked degree, collapse and kinking when the hose is flexed or moved by means of a sling or some similar device. For hose sizes 1 in. and smaller a braided asbestos fabric is used, as experience has proved that this type material offers ample strength in smaller size hose construction.

The improved Goodrich Burst-Proof Steam Hose is recommended by the manufacturer for saturated steam pressures to 200 lb. per sq. in., or superheated steam to 390° F. It is available in a range of sizes from ⅜ in. to 2½ in.

Fig. 1

If It's JUNK You're After You Can Get It *Quicker* and *Cheaper* with THE CAVINS . . .

The Cavins Automatic Hydraulic Suction Bailer and Fishing Tool (Fig. 1) utilizes the high velocity of fluid movement occurring when the potential energy of the fluid column is changed to active, or kinetic, energy by virtue of pressure differentials which are created in the well fluid and then allowed to equalize. The creation of pressure differentials is accomplished by the submergence of the bailer, one section of which is sealed tight so as to contain nothing but air at atmospheric pressure, in the fluid column. When the tool comes to rest on bottom, a Jar Stem strikes downwardly and automatically opens a valve at the lower end of the Suction Chamber (atmospheric chamber) and exposes the low pressure therein to the greater hydraulic pressure of the fluid column. The resulting rush of fluid into the tool is of such force as to pick up and carry with it all manner of movable junk or material on which the bailer is resting.

For small objects such as millings, the regular bailer sand shoe will suffice. For objects too large to enter the regular shoe, a Junk Basket (Fig. 4) is subbed to the bailer bottom. A "Skeeter Bill" (Fig. 3) is subbed to the bailer bottom for thoroughly cleaning out around and inside of large fish such as stuck tubing, gas anchors, drill collars, etc., before running a socket or spear.

Fig. 2. Illustration shows an actual recovery of a cement retainer made with The Cavins and a junk basket (Fig. 4). The small pieces were drawn up into the basket by hydraulic action, while the main body of the piece, weighing 69 lbs., was taken by a friction hold with the basket.

Fig. 3

Other CAVINS Products
Sand Pumps Screen Cleaners
Perforation Washers
Inquiries invited
See These Products on Display at the Oil-World Exposition, Houston, Texas, April 24-29

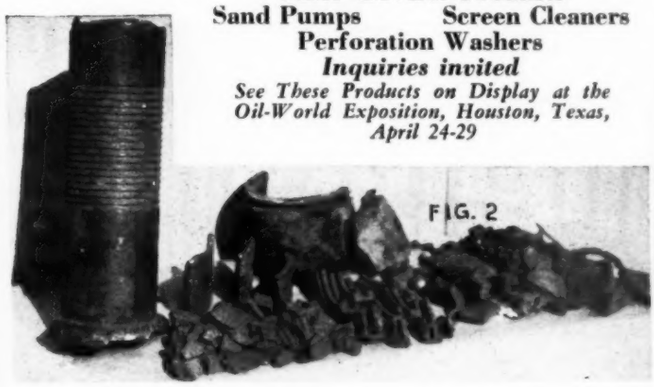


Fig. 4

The CAVINS COMPANY
2853-73 Cherry Avenue, Long Beach, California
Cable Address: "Cavins, Long Beach" Foreign Representative: R. J. Eiche
Service Branches Throughout California, The Gulf Coast and Mid-Continent Fields

Red-Rex Malleable and Medium-Pressure Steel Pipe Unions

OIL CITY BRASS WORKS, Beaumont, Texas, manufacturers of Red-Rex One-Bolt Pipe Unions, have announced their new malleable iron and medium-pressure steel unions as an additions to their line of 6000-lb.-test unions.

According to the manufacturer, these new, medium-pressure unions are unusual in that they are identical in construction to those designed for higher pressures. The accompanying cross-section illustration clearly shows

the mechanical design of these unions. Note that a single draw-screw is employed to make or break the joint. As the screw is tightened, the split collar is drawn together, applying equalized pressure on the two hubs, forcing them into sealing position on the seal ring. Loose threads between the draw collar and hub permit contraction and expansion and permit misaligned hubs to be drawn together. The seal ring is tapered on three sides to provide a leak-proof seal; one straight side on the ring wedges the ring tightly into the hub to prevent its falling out when the joint is broken.

The Red-Rex Malleable Iron Unions are offered in both "short hub" and "long hub" types. A double-tapered bronze seal ring, which is interchangeable on all Red-Rex Pipe Unions, provides a positive, leak-proof seal under all conditions of pressure and temperature to rated capacity, it is asserted. All parts for the malleable iron unions are interchangeable. They are designed for 500-lb. working pressure and are tested to 1000 lb.

The new medium-pressure Red-Rex union is designed for 1000-lb. working pressures, and is tested to 3000 lb. Its parts readily interchange with parts of the malleable-iron unions of the same size. Hubs are made of steel to permit welding on lines where this practice is desirable.

The draw screws are heat-treated alloy steel, cadmium plated, having a tensile strength of 125,000 lb. These screws are interchangeable on all Red-Rex pipe unions.

The full line of Red-Rex pipe unions is now available through supply companies. The manufacturer has offices in Houston at 634 North Edgewood Street, L. H. Kennon being in charge; in Los Angeles at 1728 East 7th Street, and an export office in New York City, 136 Liberty Street.

Electrode for A-c. Transformer Welders

A NEW arc-welding electrode for use with a-c. transformer type welders that have low open circuit voltage is announced by The Lincoln Electric Company, Cleveland, Ohio.

The new electrode, known as "Readyweld", is a low-carbon steel rod having a heavy extruded shielded arc coating possessing properties that the manufacturers state assure arc stability and easy re-striking of the arc with small low-voltage transformer welders.

"Readyweld" is intended for general welding and repair work on light gauge sheet steel. The electrode provides weld metal that possesses high strength and ductility.

Although designed primarily for use with a-c. transformer welders of low open-circuit voltage, "Readyweld" also operates well with d-c. negative plants.

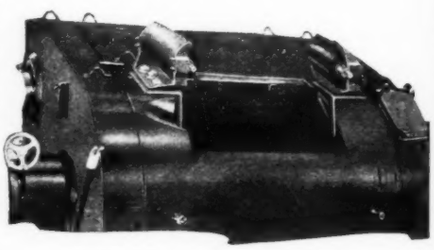
The electrode is manufactured in 3/32-in. diameter, 12-in. lengths, packed in 25-lb. containers.

Core Samples Analyzed

A SHIPMENT of core samples received from Bahrein in sealed containers were given a complete core analysis at the United States Custom House, Houston, Texas, by a trained corps operating a portable laboratory unit for Core Laboratories, Inc. The samples were analyzed for the Bahrein Petroleum Company, Ltd. Customs officials receiving the samples at Houston are shown at left in picture. The three other men, members of Core Laboratories, Inc., are C. R. Holmgren, W. L. Horner, and W. F. Swanton.

Grizzly Wire Line Turn Back

THE Grizzly Wire Line Turn Back, manufactured by the E. M. Smith Company, Los Angeles, California, consists of a tough rubber roller operating in a metal housing that can be welded or bolted to the drawworks guard at a 90° angle to the direction of line travel, so that the wire line rests lightly against the rubber roller, as shown in the accompanying illustration. A simple adjustment provides proper tension to meet specific conditions.



It is specially designed to turn back the wire line as it reaches each end of the drum, just enough pressure being maintained to make it start back smoothly and evenly, preventing it from piling-up, crawling, or overlapping, the manufacturer states. It prevents the line from dragging against the sharp edge of the guard of the drawworks, sand reel, etc., thus eliminating a large part of the wear and breakage of cable strands, it is asserted. It also protects the line from injury due to terrific blows against drum flanges, as sometimes occurs when the whip is not eliminated.

The steel core of the tough rubber roller is packed with a high-quality grease, eliminating any necessity for lubrication. The ball bearings at each end permit the roller to spin freely, easily, and smoothly at the slightest contact with the wire line.

Tubing-to-Oil-String Packer

CAMERON Iron Works, Inc., Houston, Texas, has introduced a new packer, designated as the Type G, which provides a simple means of making a pressure-tight packoff between the tubing and oil string to relieve the oil string of pressure at the surface. According to the manufacturer, numerous successful installations in wells having recorded bottom-hole pressures to 6500 lb. offer definite proof of the sound design of the Type G packer. It has also proved successful for making successive production tests of different sands through perforations.

The operation of the packer, shown in the accompanying illustration, is relatively simple. Seal between tubing and oil string is effected by lowering the tubing string until the valve packer strikes the valve seat. Tubing is then lowered farther until about half the weight of the tubing string rests on the packer. This weight expands the neoprene packers inside the oil string. To test the seal of the packer, approximately 500-lb. pump pressure is introduced in the oil string. If pressure does not lower, the packer is holding tightly. If pressure lowers gradually, this indicates that the valve has not sealed because of trash. Tubing should then be raised until the valve packer is above the valve seat; three or four strokes of the pump will clean trash from the valve seat, and the packer may be reset and tested.

Owing to the absence of complicated slip, "J" tool, or other mechanisms, Cameron Type G Packers may be readily pulled from the hole on the tubing string at any time, it is stated.

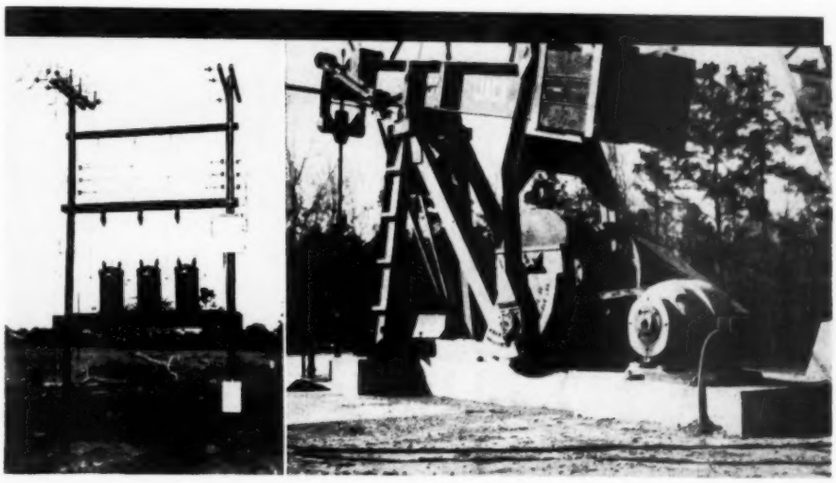
Any desired special data or information pertaining to this tool will be gladly supplied upon request by Cameron Iron Works, Inc.

Cord for V-Belts

A NEW super-flex V-belt made from Daytex Cord has been announced by The Dayton Rubber Manufacturing Company, Dayton, Ohio. This new cord has improved tensile strength, lower stretch, and, owing to interlocked fibres, minimum tendency to become lifeless, the manufacturers assert. The V-belt runs cooler and stands up under high-speed flexing, it is stated.

In the process of manufacturing Daytex Cord, a bonding-compacting agent removes the non-essential oils and waxes from the outside of the individual fibres, causing the fibres to interlock and form a strong and compact cord, it is stated. The super-flex Daytex Cord is used in the neutral axis of Dayton Cog Belts.

Although Daytex Cord has lower stretch and minimum tendency to become lifeless, further processing after introducing special rubber compounds normalizes the cord until the stretch is removed from the belt.



EAST TEXAS and RODESSA Landmarks

*LANDMARK. *Any conspicuous object characterizing a locality. Any event which marks a turning point.*

—Webster.

Webster might have been defining Purchased Electric Power in East Texas and Rodessa when he wrote the above definition for "landmark."

Such scenes as these of an electric powered pumping well and the field transformer station are certainly typical and characteristic of the locality. And the accessibility of high-lines to all parts of the field has definitely marked a turning point in additional Convenience, Safety and Economy for East Texas and Rodessa producers.

Low first cost. Low maintenance. Fewer accidents. Less fire hazard. Accurate records easily kept. Less shut-down time. All these advantages of Purchased Electric Power have been found by operating companies to be in their favor for LOWERING THE OVER-ALL COST PER BARREL OF FLUID LIFTED.

One of our engineers will be glad to show you how Purchased Electric Power can be fitted advantageously to your power problems in East Texas and Rodessa. Call us today!

SOUTHWESTERN GAS & ELECTRIC COMPANY

General Offices: Shreveport, La.

Liner Puller for Hard Surfaces

A NEW type liner puller has been announced by MacClatchie Manufacturing Company, Compton, California, that is especially designed for pulling hard-surfaced liners. This new tool, known as the "Universal," is constructed of steel, heat-treated to withstand severe usage, and is supplied in two sizes for pulling all sizes and makes of pump liners.

Operation of the Universal Liner Puller is extremely simple, the manufacturers assert. The puller legs are mounted on a long bolt and are designed so that when pushed through the liner they automatically engage on the end of the liner. The yoke is then adjusted over the cylinder head studs and tightening the combination nut places a strong, steady pull on the liner.

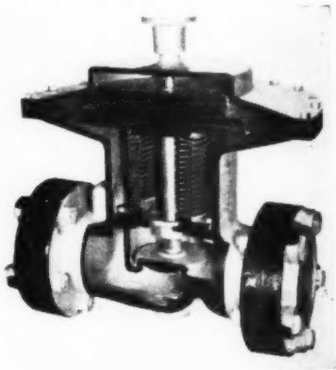
The tool touches the inside of the liner only when the legs are being pushed through to the end for setting. It will in no way harm the finished surface of any liner, an important feature when pulling only partly worn equipment. The tool is equipped with a roller thrust bearing that reduces friction and permits easy turning. The threaded mandrel is unusually strong, and is heat-treated for additional strength.

Further information may be obtained by writing direct to MacClatchie Manufacturing Company, Compton, California.

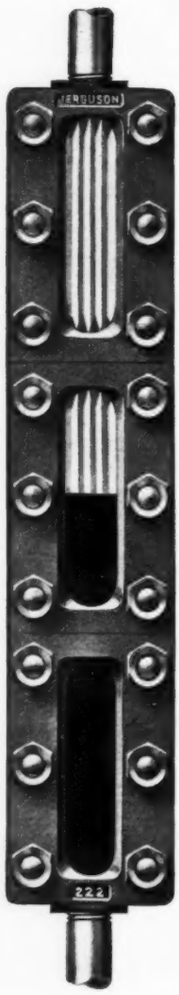
Automatic Oil-Seal Valve

A COMPLETELY automatic pipeline oil-seal valve has been developed by Black, Sivalls and Bryson Company, Oklahoma City, Oklahoma. Setting by hand for each run is unnecessary when this valve is used, the makers assert.

The purposes and advantages of this valve, as pointed out by the manufacturer are: the possibility of an air-locked system is eliminated, field labor costs are reduced, gathering station pumping costs are decreased, running time is reduced, and air is eliminated from the system.



JERGUSON



BE SURE
that the name
JERGUSON
is on your Gages

Jerguson Reflex and Transparent (through vision) Gages have been noted for over 30 years for accuracy and dependability.

Reflex Gages indicate the liquid level, no matter what the color of the liquid. Ideal for tanks, towers, still, etc., because the . . .

EMPTY SPACE SHOWS
WHITE

LIQUID LEVEL APPEARS
BLACK

Jerguson Transparent (through vision) Gages for showing color and density of liquids, are also noted for their accuracy and dependence.

Jerguson Gages Are Best
By Every Real Test

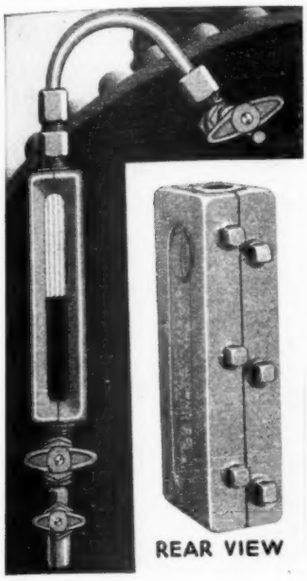
CATALOG ON REQUEST

JERGUSON GAGE & VALVE CO.
81 FELLSWAY
SOMERVILLE, MASSACHUSETTS

Clamp-Type Reflex Gauge

A NEW clamp-type reflex gauge made by The Inferno Company, Shreveport, Louisiana, is now available to the oil industry.

Each side of the gauge is housed by one of the clamps. They can be removed separately. When installing a new glass, glass and gasket are easily held in place while the first clamp is put on and tightened. Pressure from each clamp screw is distributed evenly over the area of contact between glass and clamp, so that it is impossible to exert too much pressure on any one screw. The clamps can be removed, a new glass and gasket inserted, and the clamps replaced quickly. The new Inferno "Clamp Type" Gauge has a wide and heavy glass.



REAR VIEW

The gauge is made in navy bronze or stainless steel. The navy bronze gauge, suitable for ordinary boiler service where corrosive conditions are not severe, is tested to 2000 lb. It is recommended for working pressures to 350 lb. and for temperatures to 450°F. The non-corrosive steel gauge is tested to 2500 lb. It is recommended for working pressures to 1000 lb. and temperatures to 1000°F.

Vibration-Proof Indicating Pyrometer Controller

A VIBRATION-PROOF Celectray Indicating Potentiometer, Model V, has been developed by C. J. Tagliabue Manufacturing Company, Brooklyn, New York. Photoelectric detection of the position of a light-beam reflected from the mirror of a moving galvanometer provides an undiminished high sensitivity of the original Celectray indicating controller combined with practically instantaneous response, the makers state. A new damped photoelectric circuit has been developed that does not respond to abnormal disturbance of the light-beam.

So far as vibration is concerned Celectray Model V functions somewhat as a filter, that is, the action of vibration upon the galvanometer cannot effectively be transmitted through the instrument to the control device such as a magnetic contactor. This controller can be mounted rigidly in a vibrating panel with the contactor or next to a drop hammer without regard for the possible effect of vibration. Vibration does not cause the primary relay within the instrument to operate nor does it interfere with normal action of the controller.

STURDY

—Yet Simple in Design

McKISSICK

Short Type Tubing Catcher for Wells of Average Depth

With Anchor

23"

Manufactured up to the high standard of all McKissick Products, yet so constructed that it may be sold at a reasonable price.

Especial attention has been paid to assure sufficient clearance of both heads and slips. Few working parts, assembled extremely tolerant to allow for corrosive conditions. Ample fluid courses, with well protected slips assure a higher degree of SPEED and SAFETY in tubing operations.

POSITIVE ANCHOR ATTACHMENT

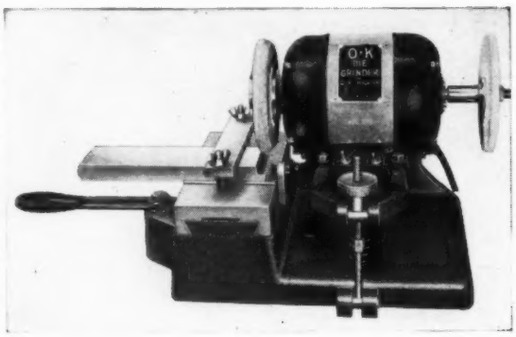
With the anchor attachment the McKissick catcher may be set at the exact point desired by merely rotating the tubing to the left. No raising or lowering of the tubing to anchor. Only one part, freely fitted, functions to engage the slips to the casing for a positive anchor.

For Sale by Your Supply Store

McKISSICK PRODUCTS CORPORATION

TULSA, OKLAHOMA

O-K Machine Has New Die Grinder

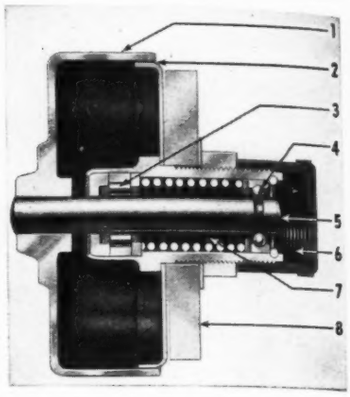


O-K Machine and Manufacturing Company, Tulsa, Oklahoma, announces its new O-K Die Grinder, a precision tool for grinding dies for pipe machines, bolt machines, and Toledo, Beaver, and hand dies. It is a sturdy, compact unit having ample power for heavy die grinding, driven by a ½-hp. motor at 3450 r.p.m., the makers state. The grinder is equipped with a 6-in. by ¾-in. wheel for die grinding, also an extra wheel for grinding-out broken teeth.

Features of the machine are: adjustment screws for taking up wear on all points; adjustable stops for grinder dies —same thickness and same distance back from point, and a special adapter for grinding Landis dies. The machine is 30 in. long, 14 in. high, and 14 in. wide, weighing 100 pounds.

Anti-Friction Idler Pulley

SKF INDUSTRIES, Inc., Philadelphia, Pennsylvania, have developed a free-running idler pulley for machines having light- and medium-



duty high-speed belt drives. The equipment consists of a balanced standard or special pulley (1), which is provided with a dust-proof protective cover (2) to form an effective seal. This seal eliminates all types of abrasive dust from the relatively heavy-duty roller bearing (3), and the stabilizing ball bearing (4). These special bearings run directly on a through-hardened, chrome-steel shaft (5), which gives the unit a maximum capacity within its compact dimensions. The ball bearing acts as an outboard bearing and insures surface-to-surface contact between the rollers and the shaft at all times, the makers state. In addition, this deep groove ball bearing carries thrust loads to permit the assembly to operate equally well in either vertical or horizontal positions. Grease cup (6) is provided so that a measured amount of grease may be placed in it every second year. At the time of the unit's assembly in the factory, an adequate amount of grease is placed in the large reservoir (7) to last the initial two years' operation (approximately 10,000 operating hours). Number (8) indicates the ease with which the unit is mounted.

With standard well-balanced pulleys, the largest unit of this type is rated for a minimum life of 50,000 working hours when running at 100 r.p.m., having an external radial load of 42 lb., and axial thrust load against the housing shoulder of 20 lb., or 9½ lb. in the opposite direction, it is asserted. At 500 r.p.m. this external load may be 26½ lb., and the thrust loads 13 or 6½ lb. At 2500 r.p.m., the respective loads may be 20 lb. radial; 10 or 6½ lb. thrust.

1st NATIONAL

STATEMENT OF CONDITION

At the Close of Business, March 29, 1939

ASSETS

Cash on Hand and Due from Banks	$ 53,693,825.12
United States Securities Owned	24,129,029.65
Stock in Federal Reserve Bank	321,000.00
Other Stocks and Bonds	2,726,649.45
Loans and Discounts	40,983,790.38
Furniture and Fixtures	293,986.90
Banking House	2,345,000.00
Other Real Estate	1,211,584.80
	$130,704,846.30

LIABILITIES

Capital Stock		$ 8,000,000.00
Surplus Fund		2,700,000.00
Undivided Profits, Net		3,479,367.55
Reserved for Taxes, Etc.		195,580.99
Reserved for Dividends		320,000.00
DEPOSITS		
Individual	$75,081,816.57	
Banks and Bankers	33,721,465.87	
U. S. Government	7,206,615.32	
		116,009,897.76
		$130,704,846.30

Includes over $18,000,000.00 in Loans to the Oil Industry

FIRST NATIONAL BANK
IN DALLAS MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

New Chemical Engineering Laboratory For Case School

Built especially for teaching and research in phases of chemistry bearing on industrial production, including petroleum and other fuels, the new Chemical Engineering Laboratory of Case School of Applied Science has been completed at a cost exceeding $300,000, and was formally opened on April 15. At a dedicatory luncheon at the Cleveland Club preceding the inspection of the building, Dr. William Reed Veazey, chief of research for the Dow Chemical Company, Midland, Michigan, and former professor of chemical engineering at Case, was the principal speaker. Guests at the luncheon included several hundred representatives of industries in Cleveland and throughout Ohio.

The new building provides extensive facilities for teaching and research in physical and organic chemistry, chemical engineering, and plant design. Included in the new structure is a special fuel, water, and lubricants laboratory, which has been equipped with special instruments and apparatus by A. Friedman, Case '07, president of the Chemical Rubber Company of Cleveland. Seven offices provided with private research laboratories for members of the teaching staff of the Department of Chemical Engineering are included in the structure.

Oil Well Supply Talkie on Sucker Rods to Be Shown at Houston

"Sucker Rods from Mine to Well," a talking picture produced under the supervision of Oil Well Supply Company, will be included as part of the moving picture program at the forthcoming Oil-World Exposition in Houston. Of special interest is the use of animated diagrams and transparent samples illuminated by polarized light to emphasize the causes of sucker-rod failure.

In addition, this motion picture shows the various processes in the manufacture of sucker rods and the methods of laboratory testing. Also included are recommended field practices for the care and handling of rods.

I.P.A.A. Committee on Award Named

Pesonnel of the Committee on Award for the essay contest sponsored by the Independent Petroleum Association of America has been announced from the association's general offices at 704 Thompson Building, Tulsa, Oklahoma.

Burdette Blue, president of the Indian Territory Illuminating Oil Company, Bartlesville, Oklahoma, is chairman of the committee.

Frank M. Porter, Wirt Franklin Petroleum Corporation, Oklahoma City, is vice-chairman of the Committee on Award.

The contest, open to senior high school students in the 18 oil-producing states, will close June 30. The grand prize, $1000, will go to the contestant adjudged by the committee to have submitted the best essay on "What Oil and Gas Have Done for My Community." Eighteen prizes of $100 each will be awarded for the best essay from each state, including that from which the grand prize essay is submitted.

Dowell Opens District Office at Houston, Texas

Dowell Incorporated announces the opening of a district office at 1209 Shell Building, Houston, Texas. C. T. Young is district manager and S. C. Morian district engineer.

Remember this . .

YOUR MARTIN DECKER TRANSACTION IS NOT COMPLETED WHEN THE PURCHASE IS MADE!

Oil field instruments to be accurate must also be relatively delicate. They require careful attention to insure constant reliability in all drilling operations. That is why *Service* is so important when purchasing equipment of this type. *Service* means trouble-free operation, lower maintenance costs and longer life for the instruments you buy.

When you purchase Martin-Decker Instruments, *Service* automatically becomes part of the transaction, *for Martin-Decker is the only manufacturer of instruments of this type with 21 Distribution and Service points located in every active field in the country!* Wherever you drill, trained and experienced Martin-Decker Service men are quickly available to meet all your installation and maintenance requirements.

Start *now* to take advantage of Martin-Decker's wide service facilities. Contact your nearest Reed or Martin-Decker Representative today for any installation or repair problem you may have!

See the new Slim Hole Weight Indicator and the new 1000 l.b. Unitized Mud Pump Gauge at the Show!

THE CLIPPER

is a complete self-contained portable Weight Indicator for all short jobs. It reads in both pounds and points—and has vernier accuracy for every type of work.

Martin-Decker Products and Service are available through all Reed Roller Bit Shops and Warehouses in Wyoming, New Mexico, Texas, Oklahoma, Kansas, Illinois, Arkansas and Louisiana . . . in California, through Martin-Decker's own Office and Plant at Long Beach, or through their Bakersfield Branch!

HOME OF THE WEIGHT INDICATOR

MARTIN DECKER CORP.

LONG BEACH, CALIFORNIA

SAN JOAQUIN VALLEY: A. F. McQUISTON, BAKERSFIELD, CALIFORNIA

MID-CONTINENT DISTRIBUTOR: REED ROLLER BIT COMPANY, HOUSTON, TEXAS

Shell Oil and Shell Petroleum Merged

Shell Oil Company, operating in the ten western states and Hawaii, and Shell Petroleum Corporation, operating in the middle west and south, were merged April 1, according to announcement from the offices of Shell Oil Company at San Francisco, California. The name of the new corporation will be Shell Oil Company, Inc. The new corporation acquires the marketing operations of Shell Union Oil Corporation in New England and the Atlantic states.

The officers of the new corporation are: R. G. A. Van Der Woude, chairman of the board; S. Belither, vice-chairman of the board; Alexander Fraser, president, St. Louis, Missouri, and S. Belither, executive vice-president, San Francisco.

Vice-presidents, St. Louis: F. A. C. Guepin, H. H. Anderson, R. P. Bascom, E. D. Cummings, A. J. Galloway, P. E. Lakin, R. B. Roark, and T. E. Swigert.

Vice-presidents, San Francisco: F. S. Clulow, E. F. Davis, D. Heggie, L. G. McLaren, and J. U. Stair.

Vice-president, New York: L. T. Kittinger.

J. W. Watson is treasurer; J. T. Dickerson, St. Louis, secretary; A. R. Bradley, San Francisco, assistant secretary, and E. C. Peet, assistant treasurer, San Francisco.

C. F. Succop Celebrates 25th Year as President of American Roller Bearing

On Saturday, April 15, friends and business associates of Clarence F. Succop celebrated his 25th anniversary as president of the American Roller Bearing Company, Pittsburgh, Pennsylvania. Coincidentally, the occasion also marked Succop's 50th birthday. He is

C. F. SUCCOP

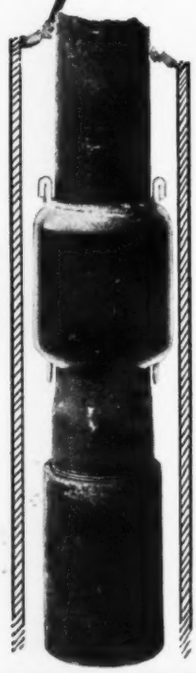
one of Pittsburgh's most prominent engineers, having a wide acquaintance in the steel and oil industries.

When C. F. Succop became president in 1914, the American Roller Bearing Company had been operating for about six years. Beginning with this young, undeveloped business, he made consistent improvements in the engineering and design of heavy-duty roller bearings, and introduced the company's products into many of the most important industries in the country, particularly in equipment used to produce oil, steel, and heavy-duty machinery of all types.

Prior to becoming president of the American Roller Bearing Company, Succop was an engineer with General Electric Manufacturing Company, and subsequently sales manager of the Ideal Electric Company, Mansfield, Ohio. He then became general manager of Ohio Sterling and Manufacturing Company, from which position he advanced to his present post.

DANGER

Thousands of Dollars at Stake



Grizzly Tubing Protectors positively prevent wear on tubing collars like that shown by the unretouched illustration above. The illustration at left shows how they eliminate all contact between tubing, collars and casing; and provide complete protection against parting of the tubing due to constant wear and cutting away. Made from a special material that is dense, hard, and tough, and is better than steel for taking this rough treatment; Grizzly Protectors provide the best insurance at minimum cost against loss of time, tubing and production. Ask your supply man for Grizzly Bulletin No. 14-OF.

E. M. SMITH COMPANY
600-650 South Clarence Street Los Angeles, California, U. S. A.
Complete Stocks Maintained in Our Warehouses at:
1121 Rothwell Street, Section 16, Houston, Texas
1008 S. E. 29th Street, Oklahoma City, Oklahoma
Export Office: Continental Emsco Co., 30 Rockefeller Plaza, New York City
Distributed by Leading Supply Companies

GRIZZLY TUBING PROTECTORS

Clifford W. Lord Manager California Sales For Oil Well Supply

Clifford W. Lord, formerly president of the Bolsa Chica Oil Company, has joined Oil Well Supply Company as manager of sales in California, according to Lester H. Keim, vice-president. Lord's early work in the California oil business with the old Associated Oil Company and later with Captain John F. Lucey in the Mid-Continent dates back to 1912. As general manager of the Lucey Manufacturing Corporation, Lord spent six years in the Mid-Continent and eastern fields, returning to California in 1922 to join Buck and Stoddard, Inc., as vice-president and general manager, which position he held until February, 1932. He then became vice-president, and later president and general manager of Bolsa Chica Oil Company.

CLIFFORD W. LORD

A native son, born in Grass Valley, California, and graduate of the Mining Engineering College of the University of California in 1911; a member of the California Club, and the Bohemian Club in San Francisco, Lord is well known among leading California sportsmen as well as oil men.

Oklahoma City Wilcox Secondary Recovery Association Formed

The operators in the Oklahoma City Wilcox Pool have organized an association known as the "Oklahoma City Wilcox Secondary Recovery Association", the purpose of which is to make a complete and comprehensive study of the Wilcox reservoir in the Oklahoma City field with the view of possible application of secondary recovery methods in this field.

C. V. Sidwell of Tulsa, formerly with the British American Oil Producing Company at Oklahoma City, has been selected as chairman of this association's engineering committee. This committee is similar to other pool engineering committees that have been formed in Yates, East Texas, Goldsmith, and the North Basin Engineering Committee in West Texas except that this is probably the first engineering committee ever formed by operators to study a secondary recovery project.

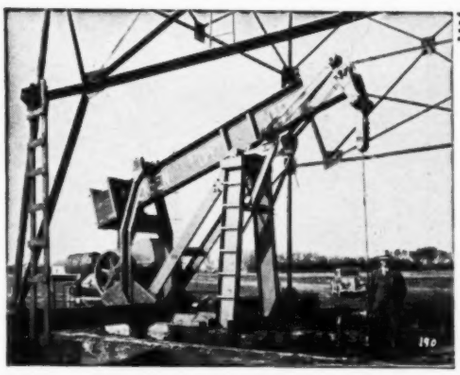
The engineering study is to be financed by the operators on a per-well basis and will probably require a year to complete before any definite conclusions will have been reached by this group.

Chemists' Directory Issued

The fifth edition of the Directory of Association Members, issued by the Association of Consulting Chemists and Chemical Engineers, Inc., 50 East 41st Street, New York City, has just been published. Those desiring the booklet can obtain a copy free upon request to the association's headquarters.

Named Representative

Negotiations have been concluded between Laminated Shim Company, Inc., Long Island City, N. Y., and the M. E. Canfield Company, manufacturers' agents, 420 East Third Street, Los Angeles, California, whereby these agents will represent the New York manufacturers in the California territory south of the northern boundaries of San Luis Obsipo, Kern, and San Bernardino counties.



EASY PUMPERS

What makes JENSEN Units so easy to pull and so dependable would take volumes to describe, although these jacks are in themselves extremely simple.

It has taken us 20 years to make them what they are. We make nothing but pumping equipment, but we make that for maximum economy and efficiency in the hands of the producer.

You'll never know about EASY OIL until you try a JENSEN Unit. Why not write us at Coffeyville, or see your JENSEN Dealer?

JENSEN BROTHERS MANUFACTURING CO.

..... *Coffeyville, Kansas*

EXPORT OFFICE: 136 LIBERTY STREET, NEW YORK

Thoroughly Modern...

● Link-Belt anti-friction roller and babbitted bearing transmission units and the complete line of Link-Belt positive drives—silent and roller chain drives, speed reducers, and variable speed transmissions—afford better ways of solving transmission problems. Among the results you get are lower power consumption—less lubrication needs—the elimination of much of that day-in-and-day-out maintenance—and greater dependability. Send for catalog. Link-Belt Company, Chicago, Indianapolis, Philadelphia, Dallas, Houston, Los Angeles, New York, or any of our other offices, located in principal cities. 7518-A

The Super Model LINE SCALE

The Super Model Line Scale is specially designed for use in the Gulf Coast on deep wells where the bit goes below 8,000 feet. This model, like all Line Scale models, is absolutely ACCURATE at all times—super sensitive and rugged enough to withstand the hardest usage. Tested to 500,000 lbs.

"Just Read the Dial"

Line Scale Co. Inc.

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OKLAHOMA CITY, OKLAHOMA

What Makes A Success Story?

Isn't it the determination to excel and better previous marks—the conviction never to be satisfied with a complacent "good enough?"

That's how we feel about it. It's the way we explain our constant vigil to keep O'Bannon Products the highest in quality and service—to make each one of them a "success story."

Take valve cups, for example. They all look pretty much alike, but there must be some reason why men who try O'Bannon Cups come back for more—and tell us they get better runs.

It IS hard to explain. We can mention that O'Bannon Cups are absolutely uniform, accurate in all dimensions, and made of the finest materials—but you can convince yourself so much more conclusively by just using a few.

The next time you buy some, won't you ask for O'BANNON CUPS?

•

Made in Ft. Worth by

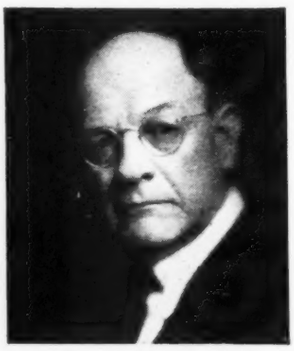
WALTER O'BANNON COMPANY

TULSA FORT WORTH

GORDON G. GUIBERSON
Newly Elected Executive Vice-President and General Manager

S. A. GUIBERSON, JR.
Chairman of the Board

S. A. (Allen) GUIBERSON, III
Newly Elected President

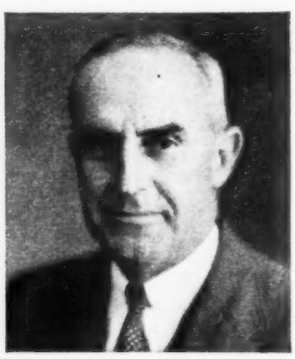


N. G. (NAT) GUIBERSON
Vice-President

Second Generation of Guibersons Takes Reins

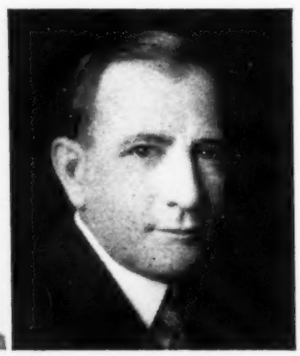
On the occasion of its twentieth anniversary, The Guiberson Corporation, Dallas, Texas, has announced promotions throughout its executive staff, chief among which are the advancement of S. A. Guiberson, III, oldest son of the founder, to the presidency of the corporation, and of Gordon G. Guiberson, second son, to the executive vice-presidency and general managership. S. A. Guiberson, Jr., widely known pioneer in oil producing and tool manufacturing, and founder of the company, remains chairman of the Board, and his brother, N. G. (Nat) Guiberson, who was the company's general manager for many years, remains vice-president. S. A. Guiberson has been prominent in the industry since he helped to develop and became exclusive licensor for the tool joint, many years ago.

S. A. (Allen) Guiberson, III, has served the corporation a number of years as vice-president in charge of the company's Diesel Engine Department, and Gordon G. Guiberson advances to the general management from the position of general sales manager, which he has held for the last two years.



H. M. HASELTINE
Newly Elected Assistant to the President

H. U. GARRETT
Newly Appointed Sales Manager



M. W. MATTISON
Newly Elected Treasurer and Comptroller

R. D. WALLIS
Newly Appointed Secretary and Assistant Treasurer

Nathan Adams to Be Honored

Dallas is making ready to kill the fatted calf in preparation for a three-day golden anniversary celebration honoring Nathan Adams, president of the First National Bank in Dallas. On April 22 Adams will have completed 50 years of continuous service with the bank, and more than a half century of public service in Dallas.

NATHAN ADAMS

To the celebration leading oil operators, industrialists, and financiers from the Southwest and the nation will be invited. The schedule of events begins with a dinner the night of April 19 given by associates and employees. The following day a second dinner will be given by friends and neighbors. To this affair notables of the nation will be invited. Friday, April 21, the bank will hold open house in its banking rooms throughout the afternoon to the citizens of Dallas and Texas.

Of particular interest to oil men is the Adams celebration for it was he who promulgated the plan now in use by Texas banks to finance oil development in the Southwest. Also, it was Nathan Adams who suggested the creation of the tender board when East Texas washed out the world's markets and bid fair to wreck the petroleum industry.

Dowell Establishes Two New Districts

Dowell Incorporated announces the establishment of two new operating districts, one at Salem, Illinois, and the other at Owensboro, Kentucky.

The treating stations now at Flora and Lawrenceville, Illinois, and Owensboro, Kentucky, will continue to serve the Illinois, Indiana, and Kentucky areas as in the past. The Salem office will be quartered temporarily in the State Bank Building. J. H. Courtner, formerly district manager at Lawrenceville, has been transferred to Salem in the same capacity. W. W. Love, research engineer, and L. D. Brunson, sales engineer, formerly at Lawrenceville, will now be stationed at Salem. Bernard E. Langley, sales engineer at Seminole, Oklahoma, has been transferred to Salem.

Better to coördinate management, research, engineering, and sales throughout the closely related fields of Kentucky, Indiana, and Illinois, Owensboro was chosen for the logical headquarters to serve these particular areas.

The Lawrenceville, Illinois, station, which for several years operated under the Lawrenceville office will in the future be operated as a part of the Owensboro District and will continue to serve a greater part of the new work coming up in southern Indiana and the southeastern counties of Illinois along the Kentucky-Indiana line. Leo Courter, who for the last year has been station manager of the Owensboro station, has been appointed district manager of the Owensboro district. R. S. Bonham, in charge of the Lawrenceville station since 1937, will continue in charge there.

Frick-Reid Opens Store at Bunkie, Louisiana

The new Frick-Reid Supply Corporation store at Bunkie, Louisiana, was the first established in that field. M. L. Eubank, salesman, was transferred from the Frick-Reid store at Lake Charles. M. C. Wertz, Bunkie store manager, has been manager of the Frick-Reid store in Shreveport.

M. L. EUBANK

M. C. WERTZ

PROVED
on All Kinds of Mud Screening Jobs!
● For the lowest cost method of reconditioning rotary mud—use Link-Belt Screens. They have many exclusive features, such as fine mesh stainless steel screen cloth, rubber-cushioned; adjustable feed; enclosed vibrator unit; unitized collecting tank; self-contained drive, etc. Made in two sizes—24″ x 48″ and 48″ x 60″ screening areas. Send for Folder No. 1772.
Link-Belt Company, Philadelphia, Houston, Dallas, Los Angeles, Indianapolis, Chicago, New York. Sold by most supply houses. 7744
LINK-BELT Vibrating SCREEN

Continental Supply Company Formally Opens New Plant

THE Continental Supply Company formally opened on March 23 its new office and warehouse building at 6015 Navigation Boulevard, Houston, Texas. An open-house and barbecue was held, which was well attended by oil men in the area.

The new building is modern in appearance and appointments and consists of two divisions: the offices, which includes showrooms, and the warehouse. The offices and showrooms are air-conditioned and occupy a total of 3600 sq. ft. of floor space. The warehouse proper has a main bay 60 ft. wide by 360 ft. long. Two side bays each 25 ft. wide and 140 ft. long adjoin each side of the office portion.

Twenty cars of pipe can be loaded daily from the pipe yard, using the new 25-ton locomotive crane. Trucks can be loaded with equal facility. The entire yard is floodlighted at night, making possible 24-hr. service.

Above—New office building and warehouse

Right—Pipe yard. Twenty railroad cars of pipe can be loaded per day; trucks with equal facility

Petroleum Reserves Increasing at Double the Rate of Production

Scientific exploration and increasingly greater knowledge of the best methods of producing petroleum are building up this country's underground reserves of crude oil at nearly twice the rate at which it is being produced.

Proved reserves on January 1, 1939, according to the recent report of a committee of the American Petroleum Institute, indicate that, in the five years from 1934 through 1938, new discoveries of petroleum totaled more than 9,500,000,000 bbl. Discoveries, which include changes in previous estimates of older fields based on better knowledge of underground oil sands, averaged more than 1,900,000,000 bbl. annually. Average crude oil production, in the same period, was less than 1,100,000,000 bbl. a year.

As a result, more than 800,000,000 bbl. of petroleum, on the average, have been added to the nation's proved reserves each year since 1934. Total known reserves on January 1 were 17,348,146,000 bbl., according to the committee, the highest point in the industry's 80-year history.

As late as 1925, proved reserves were estimated only at 5,000,000,000 bbl. Since then more than 13,000,000,000 bbl. of oil has been produced, and now at least 17,000,000,000 more bbl. are known still to be in the ground. This inventory covers only reserves proved by drilling. It takes no account of possible discoveries in the more than a billion acres of potentially oil-bearing land not yet completely explored and tested. Nor does it include any estimate of probable increases in reserves in some fields now producing but incompletely tested.

The widespread use of scientific methods of locating oil far below the earth's surface, and ever-greater knowledge of how to get the maximum amount of oil from the ground, once a pool is discovered, account for the steady increases in petroleum reserves. Wells more than 10,000 ft. deep are becoming commonplace, and one, the deepest hole in the world, was drilled nearly three miles into the earth. Better spacing of wells, more intelligent utilization of underground and induced pressures, the chemical treatment of oil sands, and other modern engineering knowledge, also are increasing the reserves because they make it possible to recover a greater proportion of the oil from the known pools. New methods developed in recent years are extending the life of pools believed near exhaustion.

Electrical Associations Meet in Houston, Texas, May 3-5

The annual joint convention of the Petroleum Industry Electrical Association and the Petroleum Electric Supply Association will be held at the Rice Hotel, Houston, Texas, May 3, 4, and 5.

During the three-day session the following papers will be presented:

"Structural and Inductive Coördination," by E. B. Jennings, foreign wire relations engineer, Southwestern Bell Telephone Company, Dallas, Texas.

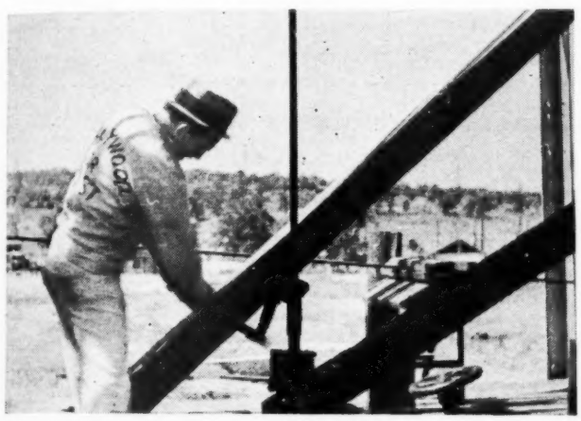
"New Lighting Tools for Tomorrow's Jobs," by Samuel G. Hibben, Illuminating Engineering Society, Westinghouse Electric Manufacturing Company, Bloomfield, New Jersey.

"Protection of Human Lives and Property . . . Hazardous Locations . . . Prevention of Fire and Explosions," by C. W. Gustafson, Mutual Fire Prevention Bureau Chairman, Article 500 National Electric Code, Chicago, Illinois.

"Applications of Electrochemistry to Cathodic Protection," Dr. Scott Ewing, National Bureau of Standards, Washington, D. C.

At the banquet on Thursday the address, "The Justification of American Business," will be delivered by Dr. G. W. Allison, field representative, Edison Electric Institute, New York City.

Movie Shows Proper Care of Sucker Rods



Rodney socks a coupling

Rodney's rule for unscrewing a tight joint is this: "One sock is worth 50 wrist-pounds." The above illustration is a scene from the movie called "Progress in Sucker Rods," sponsored by the S. M. Jones Company.

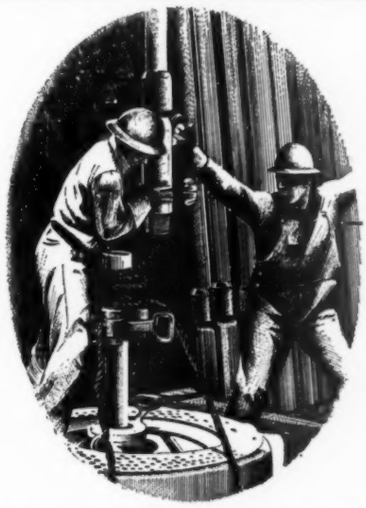
The picture was made for the purpose of instructing field men in the proper handling of sucker rods and has been shown at various points throughout the industry. It will be shown again at the Oil-World Exposition in Houston, Texas, this month.

Grant Oil Tool Company Opens Houston Branch Warehouse

Grant Oil Tool Company has opened a branch warehouse at 5807 Navigation Boulevard, Houston, Texas. Norman H. West is in charge of the warehouse and T. J. Mullins is in charge of sales.

Kyner-Long Corporation Opens Houston Office

The Kyner-Long Corporation, Fort Worth, Texas, has opened an office and warehouse at 2726 Telephone Road, Houston, Texas. R. R. Kyner, president, will have his office at that point and a complete line of gas-lift valves and fittings will be carried.



IT'S A PROTECTED JOB

Note the Protectors on the drill pipe. That's the surest insurance that the drill pipe is protected against undue wear in contact with the casing. Patterson-Ballagh Protectors are made of the World's toughest rubber, specially compounded for this service. Ask for Catalog.

Patterson-Ballagh
Drill Pipe and Casing
PROTECTORS

PATTERSON-BALLAGH CORPORATION
Plant and General Offices: 1900 East 65th Street, Los Angeles, California. Mid-Continent Office: 1506 Maury Street, Houston, Texas. New York Office: 39 Cortlandt Street, New York City.

DEVIL-DOG
OIL WELL CHAINS

FOR DEEP WELL DRILLING

Whether drilling shallow or deep, in hard or easy going, you will find it money-saving practice ALWAYS to use a better class of oil well chains . . such as the Jeffrey Devil Dog series.

Built to the standards of the American Petroleum Institute, you will find in these chains plus-values derived from discriminating selection of alloy steels, balanced construction without excess weight, and precision manufacture. Try a better chain on your next job . . ask for DEVIL DOG.

Jeffrey chains are carefully boxed and clearly labeled for protection . . ease in handling and storage. Visit our display of Chains, Mud Screens and Feeders in the Jeffrey Booths 659-661 during the Oil Show.

The Jeffrey Manufacturing Company
897-99 North Fourth Street, Columbus, Ohio
In Texas: 6358 Auden Street, Houston

All Alloy RIDGID

UNCONDITIONAL GUARANTEE
If this Housing ever Breaks or Distorts we will replace it Free
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TRADE RIDGID MARK

pays for itself in wrench repair savings

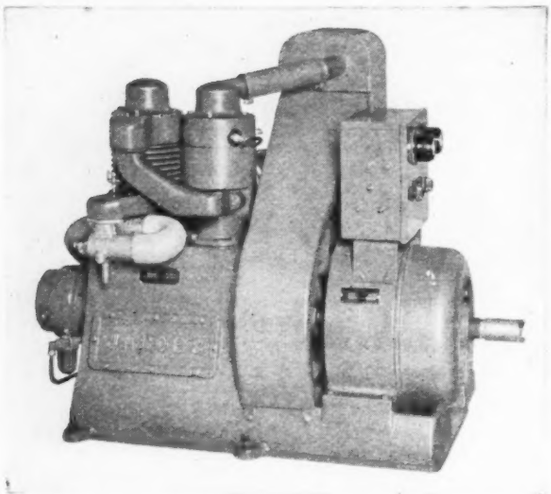
When you buy a RIDGID, you get a unique wrench that stays on the job, costs you next to nothing for repairs. For that housing guarantee means what it says — no bother or expense for housing repairs. But millions of users like it for other reasons, too — the adjusting nut that spins easily in all sizes, 6" to 60"; safe action replaceable chrome molybdenum jaws, handy pipe scale on hook jaw; comfort-grip I-beam alloy handle. For economy and wrench satisfaction, buy the RIDGID — at your Supply House.

THE RIDGE TOOL CO., ELYRIA, OHIO

Visit our Booths Nos. 644-646 at the Oil-World Exposition • April 24-29

RIDGID PIPE TOOLS

JACOBS *Special* CATHODIC UNIT



ENGINEERED exclusively for the cathodic protection of pipe lines. Two years in development... Heavy duty, slow speed, few moving parts, no valves, gears, belts or pumps to wear out and cause trouble. Unequaled in long life, and freedom from attention. Inspection required only four times annually. Gas or gasoline operated.

Write for complete literature today

THE JACOBS WIND ELECTRIC CO., Inc.

Pipe Line Department

MINNEAPOLIS, MINNESOTA

ON DISPLAY, OIL WORLD EXPOSITION... HOUSTON, APRIL 24-29

Tentative Program of Natural Gasoline Association of America

A tentative program for the annual convention of the Natural Gasoline Association of America, to be held in Tulsa, Oklahoma, May 3, 4, and 5, has been announced by William F. Lowe, secretary.

Two papers on polymerization will be presented. These will concentrate on the application of this process to natural gasoline operations. The paper on the catalytic process will be by F. B. Mack, of the Shamrock Oil and Gas Corporation, and the one on the thermal process will be written jointly by W. M. Mayer of the Humble Oil and Refining Company and D. W. Wilson of the M. W. Kellogg Company, and will be presented by Mayer.

A paper discussing the trends of motor fuels and the place of natural gasoline in the type of motor fuel market that appears to be developing will be presented by either B. E. Sibley or Frank Suess of the Continental Oil Company.

J. R. Jarvis of the Lone Star Gas Company, Dallas, Texas, will read a paper on the problem of outage and discuss a probable solution.

J. E. Allison of Hanlon-Buchanan, Inc., will present a discussion of the new standard casinghead gas contract form that has just been approved by the board of directors of the N.G.A.A.

The "Kinks" session this year will occupy a full day and promises to be the largest and most interesting yet held.

The Hanlon Award again will be presented for meritorious service to the natural gasoline industry.

Annual Southwestern Gas Measurement Short Course

The program for the Fifteenth Annual Southwestern Gas Measurement Short Course to be held at the University of Oklahoma, Norman, Oklahoma, April 18-20, follows in general the successful programs of past years. Some variation in schedule from former programs has been made for the purpose of facilitating the arrangement of classes and for the inclusion of additional subjects.

All sessions will be held in the College of Engineering Building. General sessions will be held in the Auditorium. All subjects on the program will be conducted by members of the faculty of the College of Engineering, representatives of the gas and oil industry, engineers of equipment manufacturers, and others directly interested in the measurement and regulation of gas.

The purpose of this short course is to study those problems pertaining to the measurement and regulation of gas and to make available to individuals in the industry such information that may tend to better qualify them in the performance of their duties.

There is a registration fee of $3.00, which covers admission to the school, one copy of The Practical Methods Report for the current year, the General Bulletin for the current year, and banquet ticket. It is the policy of the General Committee to publish a bulletin only in even years; consequently, no bulletin will be published for this year's school.

Jon R. Long Opens Houston Office and Warehouse

Jon R. Long, Fort Worth, Texas, has opened an office and warehouse at 2726 Telephone Road, Houston, Texas, where a full stock of all pumping equipment manufactured by the company is carried. Clyde Kyle, formerly at Odessa, Texas, for the company, is in charge.

H. L. Miller Rejoins Youngstown Sheet and Tube Staff

The Youngstown Sheet and Tube Company, Youngstown, Ohio, announces the appointment, effective April 1, of Harvey L. Miller as special representative of oil-country tubular sales in the Mid-Continent field, having offices in the Continental Building, Dallas, Texas.

HARVEY L. MILLER

Miller has had long sales experience in oil-country tubular goods, beginning his first employment in the sales department of The Youngstown Sheet and Tube Company, Youngstown, Ohio, more than 34 years ago. He advanced steadily in the employment of that company and was placed in charge of the district sales office of the Youngstown company at St. Louis, Missouri, in 1914. In 1922 he resigned that position to take up other tubular sales work in the Mid-Continent field, which broadened his experience in the sales of oil-country tubular goods.

Walter H. Parker Elected Vice-President of Pittsburgh Equitable

Col. W. F. Rockwell, president of the Pittsburgh Equitable Meter Company, has announced the election of Walter H. Parker as vice-president of the company. Parker has been manager of the Liquid Meter Division for several years. In his new capacity he will have charge of all manufacturing operations in the two Pittsburgh plants as well as the factory in Hopewell, New Jersey.

WALTER H. PARKER

A graduate of North Carolina State University, Parker, previous to becoming associated with the Pittsburgh Equitable Meter Company in 1929, served as chief engineer for the Fry Equipment Company of Rochester, Pennsylvania.

Hopper Appointed California Representative

The Hopper Machine Works Company, Bakersfield, California, has been appointed warehouse and service representatives in California for products of American Iron and Machine Works Company of Oklahoma City, Oklahoma. A complete stock of equipment and competent service will be available at all times, according to American Iron and Machine Works Company officials.

DOUBLY SAFE

Each Latch, Alone, of This

B-M-W NEILSON TYPE C

Sucker Rod Elevator

is strong enough to hold the rod

In fact, of the two sizes, the LIGHT size is strong enough to easily break a ¾" sucker rod; and the HEAVY size, a ⅞" rod.

Molybdenum steel bodies. Forged steel bails. Springs and plates are quickly replaced (Exclusive with B-M-W). Two conveniently located operating latches. The plates carry the rods, hence there is no wear on the elevator body.

Complete Information on Request. See our advertisement in the "COMPOSITE CATALOG"

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. . . carry B-M-W Products, including: ● NEILSON Tools (Safety Sucker Rod Hooks, Tubing Hooks, Rod Elevators, Sucker Rod Sockets, etc.) ● ADMORE Insert Pump Anchors; ● BALLS AND SEATS (made for every pumping service, including the new TOWER TYPE Ball and Seat and the 2-WAY Non-Magnetic Crown); ● ADMORE Liner Barrels; ● TEX TYPE Plunger Fittings and Valves; ● COLLINS Belt Clamps; ● FLUID LIFTER Pumps; and ● NU-TEX Pumps.

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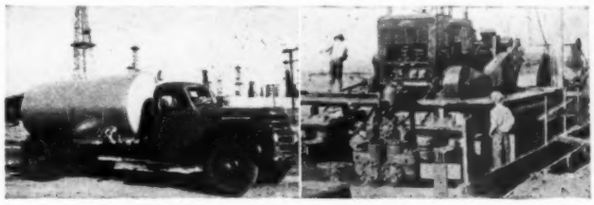
Carburetion Equipment

ENSIGN Natural Gas Carburetion Equipment has proved its superior quality and efficiency in the Oil and Gas industries for years.

The superiority of ENSIGN Equipment for the carburetion of Butane-Propane fuels (a comparatively recent development) is just as pronounced.

Visit our exhibit at the Oil World Exposition, Houston, Texas, April 24-29, Booth No. 6.

PUMPING



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Many refineries and natural gasoline plants have proved the value of MARLEY Forced-Draft Towers where absolute dependability, controlled operating flexibility and high heat-reductions are demanded.

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Pipe line pumping stations throughout the nation are served efficiently and economically by small MARLEY Spray Towers like the one above.

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KINK OF THE MONTH "in the interests of more efficient cleaning"

NOW EASIER TO RID ENGINE WATER JACKETS OF SCALE AND RUST

When rust and scale build up... engine efficiency goes down. Cooling is retarded. Pistons are apt to stick, cylinder walls scored. Overheating causes oil consumption rise. There is less power output.

To safely rid your gas and oil engines of costly scale and rust accumulations in water jackets, just circulate a solution of quick-acting Oakite Compound No. 32 through the cooling system. Rust and scale deposits are quickly dissolved. Follow with a water rinse, and water jackets are left clear and clean.

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OAKITE 1909 1939 COMPLETING 30 YEARS OF SERVICE TO INDUSTRY

OAKITE certified CLEANING
MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

Book Reviews

Soil Corrosion and Pipe Line Protection, by Scott Ewing, Ph.D. Published by American Gas Association, 420 Lexington Avenue, New York. 277 pages, 1938. Price, $2.50.

This book includes chapters pertaining to the pipe line systems of the United States, the characteristics and classification of soils, types and effects of corrosion, corrosion survey methods, bituminous and related coatings, methods of applying coatings, inspection of pipe and coatings, relative effectiveness of coatings of various materials, and cathodic protection. The work constitutes a comprehensive review of protection of pipe lines against corrosion.

* * *

About Petroleum, by J. G. Crowther. Published by Oxford University Press, 114 Fifth Avenue, New York. 181 pages, 1938. Price, $2.25.

Written in a popular style, this book was designed to acquaint the general reader with the fundamental features, methods, and processes of the petroleum and related industries. It briefly describes the history of oil from composition to decomposition, and also that of natural gas, helium, and carbon black. The book would be valuable to technically trained men only as it gives them a clear conception of the relative importance of their own and other phases of the industry.

* * *

Elements of Fractional Distillation, by Clark Shove Robinson and Edwin Richard Gilliland. Published by McGraw-Hill Book Company, 330 West 42nd Street, New York, New York. 3d edition, 267 pages, 1939. Price, $3.00.

This revised edition of this introductory study of fractional distillation includes descriptions and examples of recent practices. New material pertaining to treatment of binary mixtures, multicomponent rectification, and the performance of plate and packed towers has been added. The entire work has been brought up to date.

George A. Hays Made Vice-President Oil Well Supply

George A. Hays, sales manager, Midwest Division, Oil Well Supply Company, has been advanced to the position of vice-president, according to announcement made by Fred F. Murray at headquarters of the company, Dallas, Texas. Hays will be in active charge of the Midwest Division, which comprises oil and gas-producing areas west of the Mississippi River, including the Gulf Coast but excluding California.

GEORGE A. HAYS

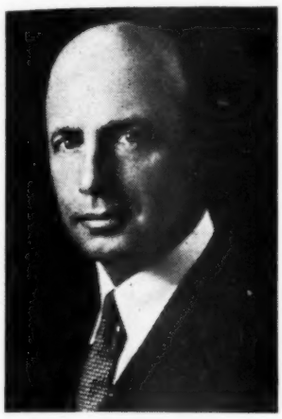
Hays was graduated from Pennsylvania State College with a degree in mechanical engineering in 1922. After graduation from college, he started work with Wilson-Snyder Manufacturing Corporation. When Wilson-Snyder was acquired by Oil Well Supply in 1929 Hays joined the staff of Oil Well Supply Company, and at the beginning of 1936 moved to Dallas, Texas. He will continue to make Dallas his headquarters.

Changes in Executive Personnel of National Supply

The National Supply Company has announced that on April 5 John M. Wilson became chairman of the board of directors, John A. Geismar president, A. E. Walker vice-president, and R. W. Eiler secretary.

JOHN M. WILSON

JOHN A. GEISMAR



A. E. WALKER

R. W. EILER

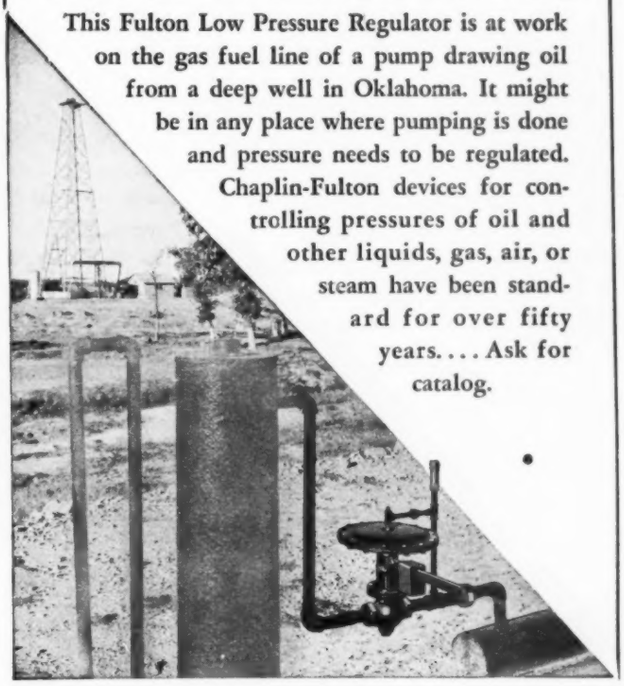
Paul Baimbridge Joins Staff Rector Well Equipment Company

PAUL E. BAIMBRIDGE

Paul E. Baimbridge has been appointed South Texas sales representative for Rector Well Equipment Company, Fort Worth, Texas. His headquarters will be at 2513 Santa Fe Street, Corpus Christi, Texas. Baimbridge formerly served Oil Center Tool Company in the same territory, and has more than 20 years experience in the oil country. He was a rig runner for The Texas Company for three years and on the same job for drilling contractors for seven years, following which he worked for Baash-Ross Tool Company as district sales representative in North Louisiana, Mississippi, and Arkansas.

SMOOTH PERFORMANCE

This Fulton Low Pressure Regulator is at work on the gas fuel line of a pump drawing oil from a deep well in Oklahoma. It might be in any place where pumping is done and pressure needs to be regulated. Chaplin-Fulton devices for controlling pressures of oil and other liquids, gas, air, or steam have been standard for over fifty years.... Ask for catalog.



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For subscribers to THE PETROLEUM ENGINEER who find it convenient to file portions of the magazine for ready reference, we have had manufactured a special three-ring binder. It is a standard size, durable leatheroid binder with dividers for each division of the industry. The binder may be had for $1.25, express paid, by filling in the attached coupon and mailing it to us with your remittance.

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TULSA, OKLAHOMA

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No doubt these are the THREE qualifications you look for, too . . . but can't always expect from ordinary hotels.
Next time you come to Houston, try the Texas State. And find out for yourself what other experienced travelers know . . . a service EXTRAORDINARY . . . comforts UNEXCELLED . . . and cuisine UNMATCHED.
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COMPLETELY AIR-CONDITIONED IN SUMMER

Trade Literature

BULLETIN No. GP-39-1, issued by Lane-Wells Company, Los Angeles, California, describes that company's gun-perforator service. The booklet is most comprehensive in its treatment of gun-perforation service and its applications. A copy of this interesting bulletin will be sent free upon request to the Lane-Wells Company.

LARKIN PACKER COMPANY, 6200 Maple Avenue, St. Louis, Missouri, is sending free upon request copies of a new bulletin, No. 26, to interested parties. The bulletin describes Larkin rotary hole equipment, several new pieces of equipment being featured.

A NEW BULLETIN published by the Reed Roller Bit Company, Houston, Texas, concerns the Reed Non-Lubricated Plug Valve. The design, construction, and operation are described in detail and illustrations are used to aid in giving a clear picture of the equipment.

INTERNATIONAL HARVESTER COMPANY, Chicago, Illinois, has issued a pamphlet describing the new International Model U-10 power unit. The U-10 has a maximum horsepower of 45 and is provided with base and other equipment suitable for oil-field work.

AN INTERESTING BOOKLET entitled "How and Why Sand-Banum is Solving the Boiler Scale Problem," gives a complete explanation of the suitability and merit of this pure colloidal concentrate in the treatment of boiler water. The booklet points out that this product doesn't act in a "chemical" sense but rather holds all water impurities in suspension and thus prevents their formation into scale. A copy may be had by writing to the American Sand-Banum Company, Inc., 9 Rockefeller Plaza, New York City.

UNIVERSAL ATLAS CEMENT COMPANY, New York City, has issued a 150-page book entitled "Oil-Well Cementing Guide." Part 1 consists of nine chapters that cover comprehensively the various phases of oil-well cementing including the different conditions encountered on many jobs. Part 2 covers construction cement and concrete with special reference to oil-field uses. Part 3 lists the characteristics of different Universal Atlas cements for oil company uses.

Copies of this new 150-page book will be supplied upon request to Universal Atlas Cement Company, Amicable Building, Waco, Texas.

ALLIS-CHALMERS MANUFACTURING COMPANY, Milwaukee, Wisconsin, has issued a new bulletin (No. 1261-B) on Vari-Pitch Texrope Sheaves. It illustrates and describes the stationary control type for occasional changes of speed and the motion control type for use where frequent speed changes are necessary. It includes dimension sheets and a variety of installation photographs.

MEETINGS

Oil-World Exposition—April 24, 25, 26, 27, 28, and 29, Houston, Texas.

Petroleum Industry Electrical Association—May 3, 4, and 5, Rice Hotel, Houston, Texas.

Petroleum Electric Supply Association—May 3, 4, and 5, Houston, Texas.

Natural Gasoline Association of America—May 3, 4, and 5, Tulsa, Oklahoma.

California Natural Gasoline Association—May 4, Richfield Building, Los Angeles, California.

American Gas Association, Natural Gas Section—May 8, 9, 10, and 11, Tulsa, Oklahoma.

American Institute of Chemical Engineers—May 9, 10, and 11, Akron, Ohio.

American Petroleum Institute, Mid-Year Meeting—May 15, 16, 17, and 18, Roosevelt Hotel, New Orleans, Louisiana.

National Association of Purchasing Agents, Annual Meeting Oil Company Buyers' Group—May 21, 22, 23, 24, and 25, Fairmont Hotel, San Francisco, California.

Illinois-Indiana Petroleum Association, Seventh Annual Petroleum Conference—June 3, Robinson, Illinois.

Pennsylvania Grade Crude Oil Association—June 15 and 16, Hotel Hershey, Hershey, Pennsylvania.

American Society for Testing Materials, Annual Meeting—June 26, 27, 28, 29, and 30, Chalfonte-Haddon Hall, Atlantic City, New Jersey.

American Institute of Mining and Metallurgical Engineers, Regional Meeting—July 10, 11, 12, 13, 14, 15, 16, and 17, San Francisco, California.

Eastern U. S. Michigan Oil and Gas Exposition—August 1, 2, 3, 4, 5, and 6, Mt. Pleasant, Michigan.

Appalachian Gas Measurement Short Course—August 21, 22, and 23, Morgantown, West Virginia.

American Society of Mechanical Engineers—September 4, 5, 6, 7, and 8, New York, New York.

American Chemical Society—September 9, 10, 11, 12, and 13, Detroit, Michigan.

American Gas Association, Annual Convention—October 9 and 10, New York, New York.

Independent Petroleum Association of America, Tenth Annual Meeting—October 18, 19, and 20, Fort Worth, Texas.

International Petroleum Exposition—May 18, 19, 20, 21, 22, 23, 24, and 25, 1940, Tulsa, Oklahoma.

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WATER CANS & COOLERS

GOTT WATER CAN
Made in 1½, 2, 5, and 10 gallon sizes.

GOTT Water Cans are the practical way to keep drinking water cool for long periods, protected from impurities and always handy to the job. Snug fitting large removable top, strongly built to withstand rough usage. GOTT Water Coolers have extra large covers and a handy non-leaking push button faucet. Your Supply Store has them, get one today! . . . . .

GOTT WATER COOLER
Made in 3, 5, 8, 10, and 20 gallon sizes

H. P. GOTT MFG. CO.
WINFIELD, KANSAS

KEEP PURE DRINKING WATER ALWAYS HANDY

Look for the *Arm-and-Hammer*

ARMSTRONG BROS.

Heavy Duty PIPE TONGS

Improved designs give these tongs greater strength and handiness. *Jaws* are drop forged from special steel; are heat treated, hardened and tested for wearing qualities. *Chains* are proof-tested to ⅔ catalog strength (3,600 to 40,000 lb.) *Handles*, forged from high carbon steel, have both stiffness and "spring." Drop forged Chrome-Nickel *Shackle*. Hardened *Bolt*. No finer tongs made. All sizes.

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Reversible Jaw Tongs
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Try Sand-Banum for 30, 60, or 90 days in your own boiler or engine. If, at the end of that period, you are not entirely satisfied with results, or you find it does not do everything we say — you pay us nothing and you owe us nothing! *Could anything be fairer?*

This is the pure colloidal concentrate that *speaks for itself* by controlling scale and corrosion more efficiently and economically . . . *It comes ready to use* in 16-ounce cans. And one can safely protects a 250-hp. boiler for a month! Arrange today for a test and know "The Best."

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